This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

614.0977
V4
S8a

B 495725 B

ANNUAL REPORT

OF THE

State Va. Board of Health

AND THE

State Health Commissioner

TO THE

GOVERNOR OF VIRGINIA

FOR THE

Fiscal Year Ending September 30, 1921

RICHMOND:
DAVIS BOTTOM, SUPERINTENDENT OF PUBLIC PRINTING
1922

ANNUAL REPORT

State Board of Health

AND THE

State Health Commissioner

TO THE

GOVERNOR OF VIRGINIA

FOR THE

Fiscal Year Ending September 30, 1921

RICHMOND:
DAVIS BOTTOM, SUPERINTENDENT OF PUBLIC PRINTING
1922

LETTER OF TRANSMITTAL

COMMONWEALTH OF VIRGINIA
State Board of Health
Richmond, *January* 3, 1922.

Hon. Westmoreland Davis,
Governor of Virginia,
Richmond, Virginia.

Dear Sir:

Complying with the law, I have the honor to transmit to you the annual report of the State Board of Health and the State Health Commissioner for the fiscal year ended September 30, 1921.

I wish to express my high appreciation of your assistance and cooperation.

Respectfully,

ENNION G. WILLIAMS,
State Health Commissioner.

Report of the Health Commissioner

To the State Board of Health:

In the last annual report of the Health Commissioner it was stated that for the year ended September 30, 1920, there had been no recurrence of influenza in epidemic form, although there had been sporadic outbreaks. For the year just ended the record has been still better. The incidence of influenza has not been above normal and the records, both morbidity and mortality, give no indication that the after effects of influenza are persisting.

On the other hand, we may anticipate a considerably higher typhoid record for 1921. The long dry, hot spell has been responsible for two factors making for the spread of typhoid, an increased number of flies and a decreased water supply. With adequate sanitation, the fly menace may be disregarded; but when water supplies are low and sanitation is not absolute there is a dangerous combination.

To the credit of the division of sanitary engineering it may be said, however, the outbreaks of typhoid or the abnormal incidence of the disease in any section have not been traceable to public water supplies over which the engineers of the State Board of Health have control or supervision. Typhoid has been occasioned by the use of water from shallow wells, from surface supplies that normally would not have been utilized; and this added to the multiplicity of flies has been the cause of the increase not only of typhoid but of other intestinal diseases.

Unfortunately this year natural and economic causes were alike inimical to health. The people of rural Virginia, depressed by the unexpectedly rapid and drastic decline in the prices for farm products of all sort that featured the last half of 1920 and the first quarter of 1921, saw this year late frosts that ruined their fruit prospects and droughts that made it impossible to hope for usual crops. As a natural result rural health work has suffered. Individuals have felt less inclined to expend money for self-protection and county boards have hesitated to appropriate public funds for anything except imperative and tangible undertakings.

For this reluctance the boards of supervisors can hardly be blamed. Money appropriated for schools or roads yields something that the people can see. The least informed are able to realize that buildings cannot be constructed without expenditures and that highways cost money; but it requires a certain amount of instruction to make people realize that health is likewise a purchaseable commodity. The population at large will not study either morbidity or mortality statistics, and constant evangelistic work is necessary for the inculcation of the health-saving instinct.

It is, consequently gratifying to note that the minimum co-operative experiment started in 1919 is still persisting and is proving attractive. Your attention is directed toward the report of Dr. W. F. Draper, surgeon, United States Public Health Service, who has been detailed to Virginia to assist in the conduct of the rural sanitation work that is being done by the State and Federal governments in co-operation with the localities. In his report you will note that, of the ten counties that started the work during 1919, two have gone into more important undertakings with fully equipped health units, and five have added each a nurse to the original force, which was only one sanitary officer.

The State Board of Health can now offer to a county any one of several plans for health work:

1. In co-operation with the United States Public Health Service, it can give money help to the extent of $1,000, and give free supervision to any county that will appropriate the remainder—$1,500, making a total of $2,500—for the employment of a sanitary officer and the payment of his office and traveling expenses. This officer is a layman who investigates insanitary conditions, shows the people how these can be corrected and endeavors to create popular sentiment for the enforcement of sanitary regulations. Further activities are described in Dr. Draper's report.

2. The State Board of Health will to the extent of $500 per annum help any county to employ a public health nurse. This nurse works with and for the school children, aids mothers and expectant mothers, is an organizer and helper for health leagues, mothers' clubs, clinics and other health activities.

3. The State Board of Health will, to the extent of $1,500 per annum, help those counties which wish to combine the two plans just noted, in other words, to have a sanitary inspector and nurse.

4. In co-operation with the International Health Board, the State Board of Health will appropriate for any county which undertakes to inaugurate a complete health unit, consisting of a full-time health officer, a sanitary inspector and one or more nurses, as much as $5,000 annually, half of which is given by the State and half by the International Health Board. This appropriation is contingent upon an equal sum being appropriated by the county. The county need not appropriate the limit. If it can secure a unit satisfactory for its requirements at $6,500, the State and the International Health Board will contribute half the amount.

Since plan No. 1 was put into operation in 1919, it has been our policy to urge this as the initial undertaking for a county. Two motives have influenced this decision. In the first place, it is our conviction that, with the elimination of the filth-borne diseases, the general health of the people will show a marked improvement and resistance to all kinds of disease will be greatly increased. As a secondary but real consideration, the work of the sanitary officer is tangible. People can see him actually at work helping construction or they can observe him as an unpaid foreman directing work. They thus have evidence that they are getting a return for the money they are spending.

To an extent that will depend naturally upon his personality, the sanitary officer can be a medium of education. Laymen have proved successful in these positions; and only laymen have been employed. There is, of course, a limit to the information that a layman is able to give or the help he can offer. When that limit is reached, the need for expansion becomes evident; and then the local authorities begin to consider plans for developing the work.

CITY AND TOWN SANITATION.

It may surprise the members of the State Board to hear that there are now in Virginia more than 175 public water supplies being inspected, through sample examinations monthly, bi-monthly or semi-annually, as may seem necessary and depending upon the source of the supply and the method of purification. More than thirty per cent of the people of Virginia obtain their drinking water from such sources; and, as was indicated before, not a single outbreak of typhoid during the year was attributable to a public water supply.

Unfortunately, however, all of the places with public water supplies do not have complete sewerage connections, and in some places the water is not used at all in connection with sewage disposal. One of the problems of the State Board of Health is to create in the smaller cities and larger towns a conviction that improper disposition of sewage should not be tolerated.

Through the organized health units, through the sanitary officers and nurses this lesson is being taught constantly; and it may be said that interest in the matter is increasing. The cities of the first class and a few of the smaller places have well equipped health departments that are functioning admirably; but it has been harder work with the towns; and the record of reduction in the filth-borne diseases would have been even more satisfactory than it has been if the towns could have been made to appreciate the importance of sanitation. It may not be the proper time to attempt the creation of interest in the establishment of town health departments, since the towns are sharing the financial depression of the rural districts; but it is always time for the education of the authorities in the dangers that lie in the unsanitary disposal of human waste.

COUNTY BOARDS OF HEALTH.

It may be proper here to express an opinion regarding county health organizations. There was a time when no one would have thought of having any person other than a doctor on a health board. There was a good reason for that policy; but the reason no longer exists.

The laws governing the organization of local health boards were enacted many years ago, when the causes of communicable diseases were unknown, and consequently there was general ignorance as to methods of preventing their spread. Then the function of a board of health was exclusively to prevent the communication of disease from one person to another. The extent of anyone's knowledge on the subject was that in some undetermined way one case was contracted from another. Naturally, therefore, the proper plan of operation was to cure such cases as had occurred and to prevent close association of sick and well. For such duties doctors were obviously best fitted, and they were selected exclusively to serve as local health officers.

Times have changed. Knowledge has increased. The causes of most diseases are accurately known; and intelligent health activities are directed toward the prevention of outbreaks rather than the cure of cases or the control of epidemics. What was an exclusive function is now a secondary activity; and the application of definite knowledge concerning communicable diseases need not be left entirely to physicians. We find in modern health departments many competent workers who are not doctors. State health boards are not now composed exclusively of physicians, and county health officers need not necessarily be physicians.

It would seem proper here to refer to that large group of diseases that are carried in human filth, some of our most dangerous diseases, typhoid, dysentery; diarrhea. To prevent these diseases is safely to dispose of human wastes. In cities this problem is not a part of the organized health work; there are special departments to care for the disposal of sewage and the protection of water supplies so they may not be contaminated.

In small towns and in rural sections these activities, so important to the health of the people have to come under the health authorities. We have felt that we could accomplish more for the health of the rural sections by attention to these problems than through any other line of effort. In fact, we speak of them as the first steps in sanitation.

CONDITIONS FOR STATE-AID.

Our conviction of the necessity for efforts to prevent the filth-borne diseases and our realization of the necessity for utilizing intelligent laymen in certain phases of health work has led us to prefer, as the first stage toward a complete program for county activity, the employment of a sanitary officer or demonstrator. This official is always a layman, who, by experience and temperament and by a certain degree of education, is qualified to conduct sanitary work. He must have an automobile so he may cover the county. His chief objects are to see that every home has a safe water supply and that human wastes are sanitarily disposed. However, his services do not end there. Where malaria is in evidence, he aids in malarial control; when there is in his county an epidemic of any character he places himself at the disposal of the county health board. In my last annual report you will find a detailed description of this plan, and it will repay you to read the report of Dr. Draper, which is attached to the report of the assistant commissioner and forms part of this year's record.

We regard the employment of public health nurses as the second stage in constructive health work. While the prevention of disease may still be regarded as the most important phase of health work, we cannot disregard another function of the health department, the promotion of higher standards of health. This is a duty that must be shared with others. The West law now requires that, at the beginning of every session, teachers must inspect the school children for defective vision, deafness, bad teeth and underweight. The teacher is not expected to make a technical examination but to report obvious defects.

Where there is a competent nurse to aid the teacher, these examinations will be made more carefully; and the nurse is better able to do the follow-up work. The teacher must report to parents whatever defects have been found, but it is virtually impossible for the teacher to visit the parents and urge the correction of defects. It must be obvious that the discovery of defects without efforts at correction is a mere waste. To follow up such investigations and urge corrective work is a phase of the nurse's duties which alone might well justify her employment.

The State Board of Health cannot always decide for a county. While our preference is for the sanitary officer as the start, to be followed by the employment of a nurse, frequently counties will prefer to have the nurse first. When this sentiment cannot be changed we submit; but we insist as far as possible that the sanitary officer comes first, not only because we think his work is usually more important, but our experience has shown that where that logical start has been made, the second and third stages are more apt to follow.

The goal of county health organization, and this we keep constantly in mind, is the complete health unit, a full-time health officer, a sanitary demonstrator, a public health nurse and clerical assistance competent to look after morbidity and mortality records, to check up quarantine and the inspection of dairies, and perform such other services as may be demanded in the office.

I have shown how local health efforts are helped by State and other agencies. This would seem to be a justifiable extension the Federal or State-aid principle. Disease knows no county or State lines. It is appropriate that the State as a whole should be willing to help any part of the State and that the nation should be willing to help any constituent State. Intelligent self-interest justifies such a course.

PREVENTION BY EDUCATION.

The ineffectiveness of quarantine as a preventor of disease may best be appreciated when one considers the large number of apparently well people who are carriers of dangerous germs. Especially in the group of diseases whose germs are carried in the secretions of the mouth and nose, there is danger of contamination frequently when there is no evidence of disease. The only safe method is to treat all secretions as potentially dangerous; and, therefore, we continue inculcating the idea that danger follows the careless cougher or sneezer and that the common drinking cup is as deadly as a pistol.

This scheme of education is furthered by every contributing agency that we can utilize. Our folders and placards emphasize the danger of the uncovered cough or sneeze and warn people against putting into their mouths anything except food and drink or the tooth brush. For the warnings to children we emphasize the danger of the common drinking cup and the childish habit of putting pencils and fingers in the mouth. We use the teachers to instill these warnings, and we aid the formation of health leagues that impress the primer of health. We place signs all over the State, warning the people against the dangers that lie in bad personal hygiene. We issue pamphlets that give more detailed information about diseases and the methods of their transmission.

Every sanitary officer, every public nurse and every other agency of the State Board of Health are units of instruction, teaching the people how to guard themselves against diseases; and it may not be amiss here to report the very gratifying success that has attended the publication of two recent manuals issued by the State Board of Health.

Our Nurses' Manual published last winter has not only had a large circulation in this country, but several hundred copies have been ordered by Canada to be used as a primer for the Canadian Red Cross nursing service. Scarcely less successful has been our Teachers' Manual which embodies an elementary course in sanitation and hygiene, with notes on first aid to the injured, descriptions of exercises that give good posture, plans for children's games and other items of information that teachers should have. This latter book has proved invaluable to the Division of Child Welfare, which has inaugurated a correspondence course for teachers, fitting those who cannot attend the summer normals so they may comply with the provisions of the West law, which makes it obligatory on the teacher to pay attention to the health of her charges.

REPORTABLE DISEASES.

As has already been said, this has been a bad year for typhoid; it has also been a bad year for the two principal nose and throat diseases, diphtheria and scarlet fever. Both of those diseases show a marked increase over last year in the morbidity tables, but I do not believe that the mortality records will be equally disturbing. Deaths from scarlet fever last year did not show an increase proportioned to the greater morbidity and I am hopeful that the same result will show this year. So far as diphtheria may be concerned, I can safely say that the death rate will not show an advance in proportion to the incidence of the disease. We have just effected an arrangement that more nearly places the country practitioner on a parity with the city physician in coping with diphtheria. Through an arrangement with the Lederle antitoxin laboratory which makes our antitoxins and vaccines, we are now able to furnish a limited supply of diphtheria antitoxin to any physician on credit. He can pay for it after he shall have used it, or, if he does not use it, he may return it when it becomes out-dated. This proposition which has been received favorably by the country doctors will certainly have an influence in decreasing mortality from diphtheria.

TUBERCULOSIS.

Taking advantage of the funds available from the tuberculosis mill tax, we established last spring a bureau of tuberculosis education under the direction of Miss Agnes Randolph, whose work in the tuberculosis field makes her peculiarly well fitted to direct this endeavor. Her report covering about four months of the year is appended. The bureau has co-operated with the Virginia Tuberculosis Association in the holding of clinics and has done much educational work. Miss Randolph has been compelled to devote a large share of her time to assisting the commission named by the last legislature to study the tuberculosis situation and make recommendations to the next General Assembly. The future of this work will necessarily depend principally upon the recommendations of that committee and the extent to which the recommendations are adopted.

The State's three sanatoria, whose separate reports are appended, have had a developing year. At Catawba the teachers' pavilion was opened. It is a most attractive building with quarters for sixteen patients. It was constructed with funds provided, half and half, by the State and by the teachers of the State. At Blue Ridge a new sixty-bed infirmary is building. This addition to the sanatorium at Charlottesville will, when completed, make the operation of the plant possible at a lower per capita cost. The withdrawal of war risk insurance cases has somewhat affected the revenues of these institution, since the Federal government pays a somewhat higher rate than is charged by the State for its citizens taking treatment. The statistics of these sanatoria and the suggestions made by the directors are all interesting and will, I trust, receive your serious consideration. I would like to call your attention specifically to one item. It will be gratifying to you to read that

Piedmont Sanatorium is being operated on the next to lowest per capita cost of any sanatorium from which figures could be secured.

CHILD WELFARE.

Thanks to the West law, the division of child welfare is now one of the most important branches of State health work. The work under this law is done under the co-operative guidance of the State Board of Health and the State Department of Education. Its work naturally falls within the purview of these agencies.

It is now an accepted fact, not needing demonstration, that the undernourished, unhealthy or diseased child, the child whose vision or hearing is defective, the child with adenoid or tonsil trouble, cannot possibly keep pace with the normal, healthy children free from physical defects. That being conceded, it must be obvious that if there are only a few of such children in a class, they will tend to lessen the standards of the whole group or retard its advancement.

We have not yet come to that stage of health work, and we may never reach the stage, where the public health authorities undertake to correct all the physical ailments of the people; but the health of children is in an altogether different position. When a Commonwealth makes its largest single investment in education it is eminently proper that it should do its utmost to make its millions of dollars bring valuable results.

However, even in this branch of public health effort the State Board of Health must proceed slowly. The West law affords the means for us to ascertain with reasonable accuracy the existence of such defects among the children as may fairly be presumed to have an ill effect upon their capacities for proper development and for the proper assimilation of an education.

Except as will be shown later, and in detail in the report of Dr. Brydon, we are not attempting to cure the ills we discover. We do, however, after ascertaining the existence of defects, use our best efforts with the parents to induce them to have their children better fitted for the struggle for existence. In the detailed report of the head of this division, you will be told how this work has been conducted and the measure of success that has been attained.

But this report should dwell briefly upon two important divisions of this corrective work that have been attempted by the State Board of Health in co-operation with local authorities or private subscribers in the several counties. I allude to the clinics for mouth hygiene and for adenoids and tonsils, and I think it only fair to say that the dental profession has been enthusiastically supporting our efforts to care for the teeth of the children. It may also be interesting to you to learn that the society of nose and throat specialists have formulated the tentative plan under which we are to work our adenoid and tonsil clinics.

MOUTH HYGIENE.

The director of the bureau of mouth hygiene reports that the efforts of the State Board of Health to create interest in healthier mouths and sounder teeth is being rewarded. Modern medical authorities are agreed that many of our ills are directly attributable to diseased conditions of the teeth and mouth, while under nourishment and stunted growth are not infrequently traceable to the slow starvation that results from inability to masticate properly. It is too soon to expect definite results from the year's inspection, but it has focussed attention on this important subject.

Dr. N. Talley Ballou, director of this work, gives a partial report that may indicate the value which this work may have. State aid was given to twelve counties holding dental clinics during the year. From eight of these detailed reports have been received. The State Board of Health contributed less than $2,750 to these eight clinics at which there were given more than ten thousand dental treatments.

It is probable that we shall need more funds for this branch of work. During the year we had to refuse aid to eight counties because our fund had been exhausted. There will almost certainly be additional requests for next year. Almost certainly the counties which have held dental clinics will wish to continue them and the example is spreading. An insufficiency of funds for work of this character is apt to cause ill-feeling and the charge of partiality; and, I think, we should avoid that if possible. Dr. Ballou's suggestion for the employment of full-time clinicians, I leave to the judgment of the board.

NOSE AND THROAT CLINICS.

There are in Virginia comparatively few places that have nose and throat specialists, and that has made more difficult the solution of the problem that is created by surplus adenoids and diseased tonsils. There are few of the usual ailments of childhood that have a more retardatory effect upon the development of a child than are consequent upon those diseased conditions of the air passages. As in the case of the dental clinics, local data are not exactly accurate, but it is safe to say that, during the year, there were treated at local clinics partly financed by the State Board of Health not less than five hundred children in ten counties; and it is extremely doubtful if ten per cent of these youngsters would ever have received treatment if it had not been for this effort.

It is a moot question just how far public health activities should go in the direction of individual treatment; but we cannot well ignore the call of the helpless, and when children absolutely needing remedial treatment are utterly unable to get it through the usual sources ordinary humanity can prompt but one course.

It seems to me that we might profitably adopt the suggestion made in the detailed report of this division and ask for an appropriation of five thousand dollars for this clinical work. You will understand that the State Board of Health only helps in the financing of those clinics that are partially financed locally. Such a sum as suggested will permit aiding, to the extent of $100 each, fifty counties annually; and from the requests that have been received since the work was started I feel sure that fifty counties would apply annually.

AIDING CLINICS.

It is possible that in this branch of work the State will have to give help only for a short time. In the full county health program, the International Health Board and the State Board of Health have a plan of diminishing appropriations that has seemed to work fairly well. The counties generally continue the work they start. It will probably be the same with these dental and nose-and-throat clinics; once they become a feature of county work, they will not be allowed to lapse because the State's appropriation ceases; but I believe that the undertaking cannot be made general unless our board gives financial help in the incipiency.

INSPECTION BY TEACHERS.

There are in Virginia thirty-six institutions whose diplomas are accepted by the State Board of Education as bases for certification. Last year plans for utilizing these agencies for the inculcation of health education were explained in my report. Since then the standard has been raised, more hours are being devoted to the study of health topics. Courses now cover: Physical Inspection of School Children, Community Hygiene, or Communicable Diseases and Their Control, Personal Hygiene, Accidents and Emergencies, Hygiene of Instruction, Care of School Plant, Health of the Teacher.

For those teachers who have not been in attendance at those schools during the year and have not been able to attend summer courses where those subjects have been taught, we have established a correspondence course which has had a marked degree of success. The interest manifested by the large number who have taken the course is gratifying in the extreme, and the examinations tend to prove that those taking the course have really assimilated the information. The lessons constituting this course are, I believe, demonstrably sound. They were carefully studied at the department before they were submitted to specialists in the several lines; and were then reviewed and edited. I am, however, attaching to this report for your consideration a copy of this course; and we shall welcome any suggestions that you may make in connection with the lessons.

EXAMINATIONS BY TEACHERS.

At first blush, medical men and some of the laity may say that this physical examination, if it is to mean anything, should be done by doctors. I can not hold to that view. There are good grounds for the contrary view, and those grounds seem to me to be determining. The public cannot see any reason why children should have to be stripped by a physician and put through a technical examination. The public health authorities are not looking for minor defects and ailments that require for their discovery such highly trained examiners. The teacher, if properly instructed is able to make an inspection that will certainly at this time subserve all practical purposes.

It may be urged that the teacher cannot certify to abnormal conditions of the adenoids. That is true, but there are superficial conditions attending a surplus of adenoids that are evident as to be virtually unmistakable. The other defects can be reported by an intelligent observer. How to determine defective vision or deafness is explained at the schools for teachers and in the correspondence course. Through the same agencies the teacher is taught how to gauge malnutrition. Bad teeth are generally evident. On the whole, I believe that the experiment has justified itself and that the plan will grow and develop. It may be added that the item of expense is also to be considered. At the very lowest estimate, the examination of the four hundred and odd thousand school children of Virginia, if undertaken by physicians, would cost the State possibly two hundred thousand dollars, if not more; but the work of the teachers is done at no cost except for instruction given to them which more than pays for itself in lines unconnected with the school. In truth it would be an excellent thing for Virginia if all its adult citizens could imbibe the health information that is given to the teachers since the passage of the West law.

THE SCHOOL NURSE.

When school nurses were first appointed in this State their chief functions were to examine children and make efforts to have those needing remedial attention properly treated. Since the former of these duties has been transferred to the teacher, the need for the nurse has grown rather than lessened. It makes little or no difference whether defects are discovered if there is no subsequent effort at alleviation or removal. That is where the nurse proves her value.

Obviously the teacher cannot afford the time necessary to visit the parents and interest them in have their children's defects corrected; furthermore she will not be able to speak as intelligently as will the nurse upon the future ill effects of untreated ailments.

Another school development undertaken by the Bureau of Public Health Nursing that has been received popularly and is doing much good is the organization of health leagues in the schools. The league makes health a game which the children play. It gives them a sense of responsibility for their own hygiene and for the sanitation of their schools and homes. It teaches them organization and co-operation; and it cannot fail to have an enduring effect on their future attitude toward health work.

NURSING GENERALLY.

The nurse connection with the school must not be taken as the whole or even the principal part of her labors. Necessarily, however, the public health nurse will have, except in times of epidemics, to confine her activities largely to the care of children and the related subject, the care of mothers. However, in that related subject there is a field that offers a wonderful opportunity for invaluable service.

Through Federal agencies, through national societies, through the efforts of State authorities there has been waging for several years a campaign to educate the public to the truth that the dangers of motherhood and infancy begin not with birth, but at the beginning of pregnancy or soon thereafter. It has been seriously stated that three-fourths of the deaths at childbirth are preventable and inexcusible, that almost as large a percentage of deaths in early infancy stand in the same category.

There is a great field for the public health nurse. When it is appreciated that there are 6,000 midwives practicing in Virginia, most of them ignorant, many of them profoundly so, the danger to the mothers must be apparent. Efforts recently have been made to instruct those midwives and some progress has been accomplished; but this class constitutes a distinct menace. The public health nurse has, here, a great opportunity. Through the organization of prenatal clinics, through instructive visits to expectant mothers, through lessons in the care of infants, the nurse can make a material and most gratifying reduction in the mortality record of mother and child.

One development of the year that calls for mention is the organization of eight public health nursing associations, groups that by implication pledge themselves to secure and support a county nurse. Upon the success of the nurses in those sections this departure may depend for its future. If the nurses so secured are successful, it may be predicted that the plan will grow until all the counties, or virtually all of them, will have nurses for public work.

As in other lines of child welfare work, the State Board of Health has not been able to meet the requests of the counties for co-operative aid. More counties have asked for nurses or appropriations for nurses than the department could supply; and the probable demands for the enusing year will be still greater. Up to the present time a considerable number of the nursing organizations have been promoted and either wholly or partially financed by the Red Cross. It is no secret that many of the Red Cross chapters last year had difficulty raising funds at their roll call or subsequently. It is highly probable that the difficulties will be as great or greater this year. This nursing work should not be allowed to lag, and the State will probably have to make some provision for an extension in this department.

ECONOMIC CONDITIONS.

This economic depression which is general throughout the country and has affected not only the Red Cross subscriptions, but campaigns and drives of every sort, may also be responsible for the increased morbidity rate throughout the whole United States. While certain diseases have a peculiar periodicity and others show an increased or decreased incidence simultaneously over large areas, such a distressing increase as has been shown this year throughout the nation is hardly to be explained in this way. We know, however, that hard times do make for ill health; and it may be that the depression through which we are passing has had its effect upon the sickness tables.

Dr. Flannagan makes clear in his report that the Virginia counties have been adversely affected in their finances and he argues for a continuance of co-operative work for counties that are struggling to establish permanent organizations; and, while he does not explicitly so state, it may be that he thinks the failure of certain smaller cities to provide adequate health protection for their citizens may also be traced to this source, lack of funds.

It would seem to me, however, that Dr. Flannagan's suggestion is worthy of our attention. He advises that attention be given during the coming year to those places that should have regular health offices and yet do nothing more than utilize the services of a physician for part of his time. The list which he gives includes virtually all the minor cities of Virginia. As a matter of fact, he excludes from the lists only nine of the large cities.

TOWN AND COUNTY.

Dr. Flannagan, however, offers a solution of the problem by showing how many Virginia towns have solved theirs. You will note in his report that many of the larger towns have combined with their containing counties in the establishment of health organizations which assure to both whole-time supervision in sanitation and disease control. That would seem to be an effective and intelligent way of handling the subject. Diseases of a communicable character, if present in a county, menace the health of the town; and similarly the sicknesses of the town will not stop at its borders.

MALARIA CONTROL.

The year's experience of two places gives an adequate idea of the value of the malaria control work inaugurated in 1920. In my last annual report, you were told about the progress of work at West Point and Virginia Beach, and you may recall the striking reductions in malaria that resulted from the work at each place. West Point has continued its efforts during the past summer, and its malaria record has been kept to a minimum. Virginia Beach, to the contrary, discontinued its work, mosquitoes have multiplied and malaria has increased.

We have recently been doing some constructive work in Isle of Wight county, and this report you will find attached. I will, however, call your attention to a small but valuable piece of work undertaken by the department this summer. It was ascertained that the gambusia, a small minnow, prefers mosquitoes and mosquito larvae to any other food; so the department began breeding these minnows and sent containers with the minnows to the authorities of districts containing streams in which mosquitoes live or to owners of ponds where the insects breed. These minnows have been distributed freely.

SOCIAL HYGIENE.

The Bureau of Social Hygiene stresses principally the educational work which it has accomplished during the year, continuing its policy of placing that feature in the foreground. The lectures given by Mr. Nelson and Dr. Yarros have created and developed interest in many quarters. Committees of influential women have undertaken in many cities to advise and instruct mothers in matters of this sort. Lecturers and literature are sent to such committees upon request.

The report of the medical division of the bureau recites that any sufferer from a venereal disease can get at a minimum cost or at no cost if unable to pay at any one of thirteen places in the State—including all the larger cities. The localities are conducting the clinics, but the bureau furnishes free drugs upon demand. Some of the clinics had been receiving some help through the funds given by the Federal government, but that source was closed June 30th. However, all clinics have been continued by their localities.

Law enforcement for a social hygiene bureau is more difficult than in other lines. Doctors do not like to report venereal cases, and rarely do so if they can get out of it. While it is true that the law requires reporting such diseases, the ages-old idea of the confidential relation between physician and patient is not easy to break by statute. It is only fair to say that respect for the law is increasing and physicians are becoming more reliable in their reporting.

Dr. Flannagan calls attention to the need of some detention place for diseased women of this class. He deplores the necessity of sending all, or practically all, women arrested under this law to jail when they should be sent to a detention hospital for cure; but jail is the only recourse now open to the authorities, since Ivakota farm, the only place for the purpose in all Virginia, is crowded to the limit.

HOTEL INSPECTIONS.

May I not ask your particular attention to a topic connected with hotel inspection before I epitomize the report of work done in that field? At present the State Board of Health has an inspector who must visit every inn or lodging house in the State where ten or more persons are fed or lodged for pay. Every place that he visits, if food is sold there, must also be visited by an inspector of the Dairy and Food Department. This seems to me to be a useless and unnecessary expense to the State and a nuisance to the inn-keeper. I think that either the Board of Health or the Dairy and Food Department should undertake the work.

I bring this to your attention now besause, if a suggestion included in the report of our inspector be adopted by the legislature, there will be greatly increased duplication. Instead of having ten rooms as the minimum for inspection, Captain Gilkerson, the inspector, asks that the limit be placed at five.

Again the inspector calls attention to the practice of the road authorities of changing the locations of their camps without notifying the State Board of Health. This unwise course is costing the State unnecessary money for new construction, and is an injustice to the convicts whose health should not be jeopardized further than is inevitable. The inspector also again protests against the practice of sending men from jails to camps without a prior examination by a physician. He claims that practically all camp epidemics have been traced to these practices. I think the State Board of Health should take some action in these matters.

The inspector suggests a number of changes in the law, so far as it affects his duties and obligations. They are included in Dr. Flannagan's report without any recommendations.

BACTERIOLOGICAL LABORATORY.

I have not available for transmission to you the complete report of the State Board's bacteriological laboratory, but this will be appended to my report when it reaches you in printed form. I have, however, an important series of suggestions from the director of the laboratory, which I would like to present for your consideration.

At the outset I may say that I am in sympathy with the ideas advanced, but I question the wisdom of inaugurating the policy at this time. You will note the principal suggestion relates to branch laboratories; and it would be difficult to overestimate the value of such a departure. The difficulties of getting cultures from distant sections and the possible uselessness of attempting examinations after the lapse of time made necessary in transit are not to be contradicted; but there is another side to the question.

There is a limit to the amount of money that the State can expend for health work; and it is our duty to see that money for the work is expended wisely. If there is a good road between Roanoke and Catawba there will be no necessity for a branch laboratory at Roanoke, for the State has to maintain an efficient laboratory at the sanatorium. If there is an adequate laboratory at Blue Ridge there will be no necessity for a laboratory at Lynchburg or at Charlottesville. If there is to be a merger of the medical schools at Charlottesville, there will be no necessity for a laboratory at Blue Ridge. The situation is so complicated that I do not feel justified in making a recommendation at this time, so I leave the subject, important as it is, for your consideration without presuming to give advice.

CONCLUSION.

Just to what extent the West law will be operated exclusively by the State Department of Education and to what extent its provisions will weigh upon the State Board of Health experience will have to determine. However, there are related duties in child welfare that will have to be under the control of your board, and these will require greater appropriations if they are to be undertaken comprehensively.

In the matter of rural sanitation I would also call your attention to increasing needs. Fortunately this work has been popular from the beginning. The agreement between the United States Public Health Service and the State Board of Health has worked admirably. There has been absolutely no friction between the parties to the contract, each has worked for the same cause and in harmony. It is fair to say that much credit for this result has been and is due to Dr. Draper, of the Federal agency.

Unless the State Board of Health has a larger appropriation for this work at the hands of the next General Assembly it is fair to assume that several counties will be disappointed when they ask co-operation. That is always unfortunate. It is not easy to create interest in health work sufficient to impel county authorities to make appropriations for the purpose; but it is incalculably more difficult to re-create that enthusiasm once it has been dampened and chilled.

Appropriations for this work are based upon reciprocal appropriations, and the State risks nothing if the counties display indifference; we are, therefore, more free to ask for money to promote this class of work than we would be for funds whose disposal depends entirely upon our judgment.

We cannot overlook the distressful rise in some classes of communicable diseases during the past year, but we may congratulate ourselves that the deaths have not kept pace proportionately with the diseases. We may further console ourselves with the thought that Virginia has suffered no more than other States and less than many; and we may, I believe, look with reasonable satisfaction upon the work of the year just closed and with a degree of optimism toward the year that is dawning.

Respectfully yours,

ENNION G. WILLIAMS,
Health Commissioner.

MORBIDITY STATISTICS.

	Typhoid		Diphtheria		Scarlet Fever		Tuberculosis	
	Reported	Estimated	Reported	Estimated	Reported	Estimated	Reported	Estimated
October, 1920	217	332	706	1,103	315	482	136	241
November, 1920	136	227	783	1,176	352	587	150	228
December, 1920	77	118	577	851	400	613	174	263
January, 1921	70	99	365	564	338	473	170	254
February, 1921	56	77	167	257	250	343	190	277
March, 1921	57	77	133	208	244	347	211	305
April, 1921	51	76	66	104	172	256	190	289
May, 1921	98	161	73	112	173	278	167	262
June, 1921	278	447	89	180	74	118	164	254
July, 1921	582	835	169	276	97	144	206	320
August, 1921	491	744	375	563	281	425	147	248
September, 1921	266	426	597	963	230	364	153	250
Total	2,379	....	4,100	....	2,926	....	2,058	....
Total estimated	....	3,619	....	6,354	....	4,430	....	3,191
1908-09	7,442	14,398	3,028	5,818	1,874	3,625	6,816	12,127
1909-10	6,771	11,843	3,379	6,279	1,517	2,653	5,760	10,545
1910-11	5,958	11,803	3,557	6,812	1,073	2,125	4,494	8,651
1911-12	4,608	8,470	3,440	6,544	2,231	4,101	4,803	8,681
1912-13	5,839	10,571	2,608	4,757	2,180	3,946	4,334	8,274
1913-14	4,012	7,430	2,901	5,179	1,849	3,399	4,515	8,297
1914-15	4,530	6,008	3,278	4,651	2,002	2,655	5,342	6,936
1915-16	4,318	6,555	3,905	5,854	1,634	2,480	3,534	5,363
1916-17	3,137	5,278	2,158	3,466	1,330	2,227	2,962	4,756
1917-18	2,374	4,016	1,388	2,382	883	1,572	2,602	4,634
1918-19	2,221	3,535	1,533	2,577	1,092	1,725	2,204	3,666
1919-20	1,607	2,493	2,610	4,056	2,058	3,307	2,153	3,393
1920-21	2,379	3,619	4,100	6,354	2,926	4,430	2,058	3,191

County Health Work in Co-Operation With the United States Public Health Service

W. F. DRAPER, *Surgeon, U. S. Public Health Service in Charge.*

Annual Report for Year Ending September 30, 1921.

The plan of work in the fiscal year ending September 30, 1921, was generally the same as that carried out the preceding year. Among the one hundred counties in Virginia are many which have never made provision for organized public health work of any kind and in which sentiment for such work is confined to a very few people. To secure from these counties several thousands of dollars for the support of adequate well balanced health departments is an impossibility at the present time. The only way in which this can be accomplished ultimately is by introducing first the simplest and least expensive form of public health work which will be effective, and gradually adding to it as public interest and sentiment develops.

The county health work conducted in co-operation with the United States Public Health Service is planned so as to enable any county to undertake at the start the one line of work which, for that particular county, will yield the greatest results in lives saved and sickness prevented for the money which is available. As the work progresses and its value becomes apparent to the citizens of the county, appropriations may be increased so as to include the line of work which will yield the next greatest returns, and so in logical sequence until the public health structure is completed. By this method of development the people are enabled to keep pace with the work and are ready to approve and accept each additional step because of the merit and worth of those which have gone before. While such a process of development may extend over a period of years, it is permanent when completed.

Almost every stage in the development of county health work has been in progress in Virginia during the fiscal year as is shown by the following:

FIRST STAGE—FIVE COUNTIES (Bath, Charlotte, Orange, Richmond, Northumberland).

County Sanitary Officer.

Appropriations:

State Board of Health	$ 700 00
United States Public Health Service	300 00
County	1,500 00
Total	$ 2,500 00

In this stage may be included thirty-nine counties in which a public health nurse is employed alone by the county, either with or without State or Red Cross financial assistance.

SECOND STAGE—FIVE COUNTIES (Chesterfield, Greensville, Henry, Lunenburg, Roanoke).

County Sanitary Officer,
Public Health Nurse.

Appropriations:

State Board of Health	$ 1,200 00
United States Public Health Service	300 00
County (including extra-governmental agencies)	3,500 00
Total	$ 5,000 00

THIRD STAGE—FIVE COUNTIES (Albemarle, Fauquier, Henry, Wise, Tazewell).

County Health Officer,
Public Health Nurse,
Sanitary Inspector,
Clerical Assistant.

Appropriations:

State Board of Health	$ 2,500 00
* United States Public Health Service	300 00
International Health Board	2,500 00
County (including extra-governmental agencies)	5,000 00
Total	$10,300 00

FOURTH STAGE—FOUR COUNTIES (Arlington, Augusta, Fairfax, Norfolk).

County Health Officer,
Public Health Nurse,
Sanitary Inspector,
Clerical Assistant.

Appropriations:

$8,000 to $15,000 all derived from county sources.

The development of the first stage of health work in counties in which no public health activities were being conducted has constituted the greater part of the work which the State Board of Health has been carrying on in co-operation with the Public Health Service. At the beginning of this plan in 1919 the work was established in ten counties, the full number that could be undertaken with the State and Federal appropriations available for this purpose. During the first year the work was conducted on a two thousand dollar budget for each county, one thousand dollars being derived from the county and the remaining thousand being contributed by the State Board of Health and Public Health Service.

At the end of the first year, six of the counties provided for continuation a second year and appropriated $1,500 each instead of $1,000 in order that the salaries of the sanitary officers might be more in proportion to the services they had rendered. The State and Public Health Service allotments remained the same, making the county budgets $2,500 each.

---

* The Public Health Service is participating in three of these counties.

Two of the ten original counties appropriated $5,000 each in order that they might enter the third stage of work. The remaining two counties made no provision for continuation.

In 1920, four new counties were secured to fill the places of the counties which had advanced to a higher stage or which had discontinued, the work being conducted in ten counties as before throughout the greater part of the present fiscal year.

During the second year five of the ten counties advanced to the second stage by employing a public health nurse in addition to the sanitary officer.

Up to September, 1921, three of the original ten counties have entered into their third year of health work (Chesterfield, Greensville, Henry). Two counties have completed their second year, but have not provided for a third (Lunenburg, Orange). Three counties are in progress in their second year (Bath, Charlotte, Roanoke). Two counties have completed their first year, but have not provided for a second (Northumberland, Richmond).

Reaching as it does, a large majority of the people in the counties in which it has been established, the work has a pronounced educational value. Many citizens who, before, have had but slight comprehension of the individual and economic benefits to be derived from improved methods of sanitation and health protection now have a practical knowledge of the subject and are its enthusiastic supporters. In many instances local prejudice has been overcome and supplanted by intelligent support.

Demonstration work of this character is of the greatest fundamental importance in the development of public health activities in our rural districts. The rate of progress which can be made in eliminating sickness and deaths due to preventable causes and in promoting the standard of health is determined absolutely by the understanding of the subject on the part of the people. It matters little how great the need may be unless the desire is present.

The success of these demonstrations in securing the establishment and continuation of public health activities of a fundamental character in a number of our counties where nothing of the sort has ever been carried on before is sufficient evidence of the value and practicability of this plan of work. It remains but for an enlightened and progressive legislature to provide the means whereby the knowledge which will result in the saving of life and promotion of health may be brought to the citizens of every county in the State and a wholesome desire awakened for local participation in the conservation of human life and happiness.

CO-OPERATION OF UNITED STATES PUBLIC HEALTH SERVICE.

Throughout the fiscal year, the State Board of Health has received the services of three officers of the United States Public Health Service who have conducted the county health work under the joint direction of their Bureau and the State Health Commissioner.

This co-operative arrangement wherein the State Board of Health and the United States Public Health Service agreed upon a definite plan of work and method of procedure and then turned every effort toward the successful accomplishment of the single purpose has proven highly satisfactory to all concerned and might well form the basis for all future co-operative agreements which the State Board of Health may enter into either with governmental or extra-governmental agencies.

Throughout the two and one-half years that the present relationship has existed the co-operative work has been conducted upon the broad sound principle that a high degree of success for the enterprise in which both are engaged will bring the greatest returns to all concerned. It is greatly to be hoped that the rural health work of the Public Health Service may be put on such a co-operative basis by Congress that it may continue to furnish to our State and local governments this valuable assistance in the development of county health activities.

OUTLINE OF PLAN OF COUNTY HEALTH WORK.

This plan of work requires an appropriation of $1;500 from county sources. To this amount the State Board of Health and United States Public Health Service allot the sum of $1,000, making the total budget for the year $2,500. This amount covers the salary of the sanitary officer employed in the county, and his transportation and office expenses.

Up to the present time the United States Public Health Service has furnished three of its officers to supervise the work which for purposes of supervision is divided into groups of three or four counties each. The supervising officers secure county appropriations for the primary establishment of the work and local appropriations from town councils, school boards and civic organizations for the carrying on of special work within local jurisdictions. They lay out the work of the county sanitary officers, assist them in their problems, and through their knowledge and experience in public health matters, assure the success of the demonstrations.

The duties of the county sanitary officers are as follows:

1. Make a sanitary survey of the towns in the county; recommend such sanitary ordinances as may be necessary for placing these towns in a sanitary condition; secure passage of same by town councils; and give all possible assistance in having such ordinances put into effect and carried through to a conclusion.

The above relates principally to the passage of a sanitary privy ordinance and the installation and operation of a system for the sanitary disposal of human excreta in towns.

2. Introduce measures for the provision of sanitary closets and a safe water supply at every school in the county. Secure funds for same, supervise the work of construction and see that it is carried to a successful conclusion.

3. Secure the installation of sanitary closets and safe water supplies at individual homes throughout the county as far as possible. (The country homes sanitated in our counties range from 500 to 1,600.) This work is accomplished by education, persuasion and voluntary co-operation on the part of the people, not by force.

4. The creation of popular interest and sentiment for public health work to the end that the county will desire a more complete health organization the following year or, at least, continue on the same scale.

5. Co-operate with the county board of health and act as its agent in carrying out measures for the prevention and control of communicable diseases.

6. During the winter months, when conditions are such as to render outside sanitary work impracticable, the sanitary officers will give systematic talks in the schools on matters pertaining to school hygiene and public health. In this connection, they will also organize health leagues in the schools whereby each school is enabled to have a health organization composed of the pupils themselves who serve as health officers and assist the county sanitary officer in maintaining the school and its surroundings in a clean and healthful condition. The league also provides for the improvement of the individual health of its members.

Such of the results of this work as can be shown in a tabular statement follow:

CO-OPERATIVE RURAL HEALTH WORK.

Monthly Report Period October 1, 1920, *to October* 1, 1921.

Homes visited	6,889
Homes revisited	5,654
Sanitary privies installed:	
L. R. S. type (septic privy)	400
Concrete vault type	28
Box and can type	705
Pit type	2,575
Chemical type	191
Number above installed where no privy existed before	751
Sanitary privies fixed over	399
Typhoid vaccinations	2,577
Water sewerage:	
Septic tanks installed	286
Sewer connections secured	118
Flush toilets installed	64
Wells new	169
Wells improved	176
Springs improved	62
Water connections, city or central supply	50
Water samples analyzed	368
Malaria control—yards of ditching	17,527
Nuisances abated	201
Malaria surveys	270
School sanitation:	
Total number schools in county	362
Schoolhouse inspections made	387
Number schools provided with sanitary toilets	160
Number schools without sanitary toilets	164
Schools provided with water supplies regarded safe	29
Feces samples analyzed	57
Sanitation of food establishments:	
Number of inspections of restaurants, soda fountains, etc.	288
Number of improvements secured	226
Malaria re-surveys	184

Educational:	
Public and school talks by supervising officer	137
Public and school talks by county sanitary officer	231
Number in audiences (approximately)	25,694
Bulletins distributed	51,860
Health signs posted	3,631
Business letters written	17,363
Newspaper articles	199
Posters and advertising cards	980
Miscellaneous:	
Special meetings and conferences	318
Additional funds secured	$12,840 10
Purposes to which funds were applied: School sanitation, second year's work, clean-up campaign, smallpox, sanitating jail and courthouse, sewer extension, scavenger system.	
Homes, stores, dairies screened	35

VALUE OF SANITARY IMPROVEMENTS INDUCED IN COUNTIES.

Through the efforts of the county sanitary officers the citizens of the several counties were induced to carry out sanitary improvements for which the cost, at a conservative estimate, is as follows:

400	Septic privies, at $50 each	$ 20,000 00
28	Concrete vaults, at $50 each	1,400 00
705	Box and can privies, at $6 each	4,230 00
2,575	Pit privies, at $7 each	18,025 00
191	Chemical closets, at $10 each	1,910 00
286	Septic tanks, at $100 each	28,600 00
118	Sewer connections, at $90 each	10,620 00
	Total expenditures for sanitary closets	$ 84,785 00
169	New wells, at $100 each	$ 16,900 00
176	Wells with new pumps or platforms or both, at $25 each	4,400 00
	Total expenditures for improved water supplies	$ 21,300 00
1,550	Yards new drainage ditches dug, at 20 cents per yard	$ 310 00
17,514	Yards old ditches cleaned, at 3½ cents per yard	613 00
	Total expenditures for anti-malaria ditching	$ 923 00
	Special appropriations for school sanitation	$ 11,340 10
	Grand total for expenditures for improved sanitation	$118,348 10

Results secured from State appropriations in county health work conducted in co-operation with the United States Public Health Service.

During the period October 1, 1920, to October 1, 1921, the amounts expended by the several agencies participating in the work were approximately as follows:

State Board of Health	$ 11,056 51
County appropriations	13,369 72
*United States Public Health Service	6,177 89
Expended within counties	118,348 10
Total	$148,952 22
	11,056 51
Expenditures outside the State Board of Health	$137,895 71

From the figures appearing above it may be seen that the expenditure of $11,056.51 by the State Board of Health in this particular plan of work resulted in the expenditure, for sanitary improvements and better health conditions, of $137,895.71 from other sources. In other words, every dollar of money appropriated by the State legislature for co-operative county health work of this character resulted in the expenditure of $12.47 from other sources for improved health conditions in the State of Virginia.

Report of the Assistant State Health Commissioner

Dr. Ennion G. Williams,
State Commissioner of Health,
Richmond, Virginia.

Dear Sir:

Herewith is respectfully submitted the annual report of the assistant commissioner of Health of Virginia for the fiscal year ending September 30, 1921. According to assignment, the following divisions of the work of the State Board of Health now come under the assistant commissioner's direct supervision and are, therefore, comprehended in this report:

1. Rural Sanitation:
   - (a) County health units in co-operation with the International Health Board.
   - (b) Malaria control work in co-operation with the International Health Board.
   - (c) Co-operative rural health work United States Public Health Service.
2. Social Hygiene:
   - (a) Education.
   - (b) Medical and clinical.
   - (c) Law enforcement.
3. Inspectors:
   - Hotel and convict camp inspections. General inspections from time to time.
4. General Health Work:
   - Lectures and addresses, conferences with county and town authorities, epidemiologic visits to communities, investigation of reported nuisances, etc.

---

* This does not include three officers temporarily assigned to the State Board of Health by the United States Public Health Service.

In caring for the work above outlined, the following personnel has been engaged during the year:

HEADQUARTERS STAFF.

Roy K. Flannagan, M. D., assistant commissioner, director of rural sanitation, Virginia director International Health Board, director bureau of social hygiene.

Miss Alma Shelhorse, secretary.

Miss Louise Washer, stenographer.

Mrs. Edna P. Fox, assistant director of education.

Chas. R. Winfree, director of law enforcement, bureau social hygiene.

Capt. G. M. Gilkeson, inspector of hotels and convict camps.

1. RURAL SANITATION.

The development of county health departments under the co-operative plan pursued in former years with the help of International Health Board funds has continued to engage the major portion of the assistant commissioner's time. It is to be regretted that the amount of funds made available by the State legislature was not sufficient to enable us to entirely match all that the International Health Board was prepared to budget with us, and so two field units (budgets 4 and 5) have lapsed, leaving $5,000 of outside funds unavailable for use in county health work. I trust that the appropriation will be sufficient during the coming biennium to permit us to use all money that may be brought to this needy public health field.

However, the rural health work in co-operation with the United States Public Health Service (Surgeon W. F. Draper in charge) under the sanitary demonstrator plan (report following) is developing so rapidly and satisfactorily that it can be said without the slightest reservation that county health work along all lines during the past year has grown and strengthened beyond any previous similar period of the State's history.

I wish to call special attention to the fact that much of this good work has been accomplished by trained laymen directors. During the war, it was apparently impossible to secure competent medical directors for our county units at the salaries available, and it was necessary to place men in charge who had shown exceptional ability as assistants to former directors. I submit the reports of the Fauquier, Halifax and Tazewell units, directed by laymen, as illustration of the fact that medical direction is not necessary to the securing of results in county sanitation or even in quelling epidemics. The conduct of county health work is mainly a job in administration requiring executive ability and the knowledge and force to induce people to do what is necessary. If this is found in the person of an experienced doctor, so much the better, but if not, the failure to possess a medical degree should not prevent the acceptance of an otherwise qualified man for the work.

County finances on the whole are at such low ebb (and doubtless will continue thus to be for the next year or two) that in order to conserve the work already done, it will be unwise for the State Board of Health to entirely withdraw support from some of the counties struggling to establish permanent health organizations. Notwithstanding this post-war money stringency, it gives me pleasure to state that since the last report the county of Arlington, formerly Unit 2, having made special tax levy for its health work, is now entirely independent of State financial aid. The health officer installed by us has been made in effect business manager of the county. (For report of this work see State Health Commissioner's reports for the years 1919 and 1920.) Four counties in Virginia now operate whole-time health organizations without subsidy from the State: Norfolk, Augusta, Fairfax and Arlington. It is to be regretted that the smaller cities of the Commonwealth are backward in providing adequate health organization. Richmond, Norfolk, Lynchburg, Roanoke, Danville, Portsmouth, Petersburg, Newport News and Alexandria are operating modern health departments, but Bristol, Suffolk, Staunton, Charlottesville, Winchester, Fredericksburg, Hampton, Harrisonburg, Clifton Forge, Covington, Radford, Bedford, Lexington and Buena Vista are simply employing a physician as health officer on a part-time basis in connection with his general practice mainly to deal with epidemics when they occur. Such an arrangement shows little apprehension on the part of the authorities of these cities of the value of public health work as a preventive of disease. I believe that special work should be done during the coming year to bring about proper health organization in these cities. The towns, South Boston in Halifax, Warrenton in Fauquier, Martinsville in Henry, Tazewell, Pocahontas, Graham, Richlands and North Tazewell in Tazewell, Norton, Big Stone Gap, Appalachia, Coeburn, Wise and St. Paul in Wise, have joined with the county health departments in their respective counties, and have thereby gained whole-time health supervision in sanitation and disease control, which part-time medical health officers cannot give. Williamsburg has combined with William and Mary College and its school of hygiene and is profiting largely thereby, having elected the professor of hygiene as health officer. The plan adopted by the towns above enumerated is readily adaptable to a number of the cities and towns of the State having part-time health officers. Co-operation between cities or towns with the counties in which they lie is an absolute essential to proper disease control since infection knows no corporate line. It would seem, therefore, the part of wisdom for them to combine in the interest of health as well as in the interest of economy and efficiency. The bureau of rural sanitation should have an extra man to aid in organization work of this character.

(a) The county health units in co-operation with the International Health Board from October 1, 1920, to the present are:

(1) *Albemarle, Unit* 1, *W. S. Keister, M. D., Director, began February,* 1920.

A consistent health department is being built up here, the principal distinctive features of which are: the hearty active backing and co-operation of the county medical society, the University of Virginia, and the Blue Ridge Sanatorium for tuberculosis, and the Jeanes and Slater funds for negro work. The Red Cross, which made the work possible in the county, is now engaged in soldier relief. The general public, too, has pledged $4,500.00 to aid the present organization to continue its good work through the current year. The detail of this and the other units appear as supplementary reports.

(2) *Arlington, Unit* 2 (*1st*), *J. W. Cox, M. D., Director, began August*, 1919.

This constitutes the most complete and comprehensive demonstration in county and suburban public health work yet carried on in the State. The unit, as indicated previously, since January the first has been independent of State and International Health Board finances. It still, however, receives some aid from the United States Public Health Service. The distinctive feature of Dr. Cox's work is that it has been carried on almost with army precision, thoroughness and discipline of law enforcement. He has made his program and stuck to it through thick and thin and with steam roller effect. As can well be imagined, he has had his troubles, but the result has been practically complete sanitation of the county and a health organization with offices completely equipped, a laboratory, resident dentist, resident nurse and stated clinics, a scavenger service functioning with clock work regularity, a child welfare division with special government appropriation, and the confidence of the general public. It is to be doubted, however, whether a less forceful or less completely trained man than Dr. Cox could have pursued such methods there or elsewhere in Virginia with success. I am loath, therefore, to recommend them for general application in our county work, but as a demonstration of what may be done in health work by co-operation and support of the United States Public Health Service, International Health Board, State and county authorities, Arlington county stands as a shining object lesson.

(3) *Tazewell, Unit* 2 (*2nd*), *H. W. Snidow, Director, began March* 1, 1921.

The distinctive feature of the health work in Tazewell has been the very efficient control of a widespread epidemic of smallpox, that prior to the organization of the unit, threatened to get out of hand. Vaccinations were made, and surprising to state, practically no friction with the public resulted. Vaccination has now been declared compulsory in the schools of the county. The financial support of the principal towns of the county has also been secured and extra sanitary officers have been placed in them. The result has been much sewer extension and almost complete sanitation otherwise. A successful tuberculosis clinic was held in the county, and a dental clinic is now in progress. A glance at the tabulation of results in Tazewell to date in the supplement will be worth while.

(4) *Henry County, Unit* 3 (*1st*), *E. C. Harper, M. D., Director, began June* 15, 1920.

There were no specially distinctive features of the Henry county unit, but consistent, persistent and energetic work along approved lines was carried on. The industrial towns of Ridgway, Bassett and Spencer and many other points were completely sanitated. Two tuberculosis clinics and a dental clinic were held. The work of sanitation is being continued with Dr. Harper's sanitary inspector, Mr. Wilson, in charge under United States Public Health Service supervision.

(5) *Wise County, Unit* 3 (*2nd*), *W. R. Culbertson, M. D., Director, began June* 15, 1921.

The special feature of the Wise county unit to date has been the intensive campaign against hookworm disease. Dr. W. A. Brumfield, teacher of public health at the Virginia Polytechnic Institute and special investigator of the International Health Board, with an assistant, has been doing resurvey work in Dickenson, Wise and Lee counties. In Wise county the organization of the unit has been placed largely at his disposal, the director believing that in no better way could he aid his sanitary work than by demonstrating throughout the county the large prevalence of intestinal parasites and the need for sanitation to combat them. The lectures by Dr. Brumfield and the director have had great educational value in preparing the way for comprehensive health work.

The venereal disease clinic held at Norton weekly by Dr. Culbertson is also a unique feature of the Wise county work. The clinic has apparently reduced the incidence of gonorrhea and syphilis in the coal fields of this section. The mine owners' association contributes to the health work largely by reason of the benefit accruing to them from the clinic. This unit has also been successful in stamping out a smallpox outbreak of considerable proportions.

Units 4 and 5 are not functioning because of lack of State funds to meet the International Health Board appropriation.

(6) *Fauquier, Unit* 6, *T. J. Robinson, Director, began October* 1, 1920.

The sanitation of Warrenton, the county seat of Fauquier, by the active work of this unit would be well worth the cost of establishing it if no other health work had been done. However, the privy building campaign in the county at large has been on such a scale that up to the present it has been impossible to inspect all that have been reported as conforming to specification. Records are in the health office indicating that 2,565 sanitary privies and septic tanks have been built to date.

The largest tonsil and adenoid clinic ever held in Virginia was conducted by this unit. Ninety-four children were operated on with complete success in two days by Dr. Jas. Morrison, of Lynchburg. A highly successful dental clinic was also conducted, local dentists being employed. The results of the tuberculosis clinics held in the county by the Virginia tuberculosis association and the State bureau of tuberculosis were likewise highly successful, 325 people being examined and 18 cases discovered. A permanent tuberculosis clinic is being established as an outcome. It is a pleasure to state that notwithstanding the failure of the county authorities to continue their appropriation to the work public spirited citizens have raised sufficient funds to continue the work in operation during 1922.

(7) *Halifax, Unit* 7, *Kolbe Curtice, Director, began March* 1, 1920.

As in Fauquier the sanitation of the largest town in the county, South Boston, constitutes the greatest single achievement of the unit. A complete scavenger system has been established and a thorough clean-up inaugurated. The towns of Virgilina, Clover and Scottsburg have also been sanitated and large areas of the county have come in for detailed and satisfactory attention. Highly successful school inspection has been done and corrective dental, tonsil and adenoid, and tuberculosis clinics have been held. The local Red Cross chapter has stood behind this unit faithfully and is greatly pleased with the results achieved.

(b) *Malaria Control Work.*—Work for the control of malaria in Virginia, formerly supervised by the bureau of sanitary engineering and conducted in co-operation with the International Health Board, was on June the fifteenth placed in the division of rural sanitation. Dr. E. C. Harper, formerly one of the field directors in county health work, was placed in charge with headquarters at Smithfield. Mr. L. M. Clarkson was assigned to him as assistant. Dr. T. H. D. Griffitts, epidemiologist of the United States Public Health Service, and Engineer Elliot H. Gage, of the same service, who had been previously detailed for malaria work in Virginia, continued their valuable aid in consulting and supervisory capacity from their headquarters in Norfolk.

The co-operative demonstration work in malaria control of the previous year at West Point continued by the aid of the town authorities to prove its value. At Virginia Beach, where good work was done in 1920, no appropriation was made for maintenance during 1921. The ditches and ponds were permitted to fill up and there was in consequence great increase in mosquitoes over the previous year and consequent malaria.

Malaria survey work and systematic educational propaganda is now being carried on in Isle of Wight county by Mr. Clarkson. Dr. Harper resigned August the first to take up tuberculosis work at Catawba Sanatorium, and his place has not yet been supplied. Mr. Samuel Anderson, a Johns-Hopkins medical student, was assigned for several weeks to the work of stocking the ponds, streams and fountains around Richmond with top feeding mosquito eating minnows. These little fish may be secured here without difficulty for stocking streams where mosquito larvae abound.

Supplementary reports in detail of this malaria work are attached herewith. These reports clearly indicate the necessity for doing more in Virginia in this largely unworked public health field.

2. SOCIAL HYGIENE.

The bureau of social hygiene established during the world war and born of the tremendous public health necessities of that time continues to function along the lines so well laid down by Dr. W. A. Brumfield, its first director. Albeit with an appropriation badly depleted by the withdrawal of Federal funds.

(a) *Education.*—Education of the public along social hygiene lines is and will continue to be the most important phase of our work—public lectures by highly qualified speakers with moving pictures, literature and exhibits, have been held in all of the principal cities and towns of the State. Our Mr. Nelson has specially stressed the necessity for the religious and educational forces of the State, taking active steps towards stemming the tide of immorality and its corollary, disease, induced by the apparent lack of parental knowledge and foresight in the training of the young. Courses of lectures in sex hygiene have been given by him to students in colleges and normal schools and seminaries of the State. This work will be extended and systematized during the coming year. Two hundred and six lectures on social hygiene were delivered by Mr. Nelson during the past seven months with approximately 43,169 people in attendance. Thirty-seven thousand, nine hundred and sixteen pamphlets dealing with the subject were also distributed by this division. Following a series of lectures throughout the State given last May by Dr. Rachel Yarros, of the United States Public Health Service, committees of influential women were organized in many cities and towns of the State for the instruction of mothers in the fundamentals of sex hygiene. Lectures and literature will be sent to these and other groups to be formed, in order that the knowledge which is power may be substituted for the prudery and ignorance that have so long obscured the whole subject.

(b) *Medical and Clinical Service.*—An infectious disease must be isolated and cured or its spread is inevitable. Venereal diseases, though most violently contagious and injurious, prior to the organization of this bureau were never subjected to the public health principles applied to the less dangerous and less socially destructive diseases, smallpox, diphtheria and scarlet fever. The bureau of social hygiene is doing its best with the means at hand to deal with the venereal diseases, syphilis and gonorrhea, in such a way that they may be prevented from continuing their previously unrestricted and blighting progress.

To this end, clinics have been established in every large city in the State: Richmond (Medical College of Virginia), Norfolk, Petersburg, Newport News, Lynchburg, Danville, Roanoke, Norton, Staunton, Charlottesville (University of Virginia), Alexandria, and Ivakota Farms, a home for delinquent girls, Clifton Station, Va. Anyone may find adequate treatment at these places at the minimum of cost, or no cost at all if unable to pay. Free drugs are furnished to these clinics and to other State institutions upon demand. The drug bill is the largest item of expense in our budget. Ten thousand dollars is now necessary to meet the present demands of the clinics, which are growing steadily in popularity. To meet this growing demand, more money is needed for this item.

On July the first of this year, the United States government, which had previously furnished one-third of all the money necessary to run the bureau, refused to make further appropriation for State aid in social hygiene work. We were, therefore, under the necessity of readjusting our activities to our restricted income. All but three of the clinics that had received aid from us were perforce cut from the pay roll. These three were the clinics at Ivakota Farms for delinquent women, at the Medical College of Virginia and at the University of Virginia hospital. We are glad to announce that all of the municipal clinics previously established by State and national subsidy, because of the great need they serve, still continue their good work under local auspices and support. The bureau was formerly enabled from government funds to pay for a nurse at Ivakota Farms. This has not been possible since Federal aid was withdrawn. The work at Ivakota, however, needs the supporting hand of the State in much fuller measure than it has ever received, it being the only place within the State where unfortunate and diseased women may be healed and helped back to self-respect and usefulness.

The following are the names of our clinicians and locations of clinics, the results of their work follow in supplementary reports:

Richmond	Medical College of Virginia	Dr. Howard Urbach
Norfolk	232 Court street	Dr. S. G. Gill
Newport News	234 Twenty-seventh street	Dr. C. B. Ransone
Danville	City health department	Dr. R. W. Garnett

Staunton	City health department	Dr. J. E. Womack
Norton	Main street	Dr. W. R. Culbertson
Alexandria	City health department	Dr. W. C. West
Ivakota Farms	Clifton station	Dr. W. C. West
Petersburg	21 N. Union street	Dr. E. W. Young
Roanoke	City health department	Dr. W. W. S. Butler, Jr.
Lynchburg	Tenth and Main streets	Dr. S. H. Rosenthal
Charlottesville	University of Virginia	Dr. D. C. Smith

(c) *Law Enforcement.*—When infected people break quarantine or refuse to abide by restrictions upon them made in the interest of the public, they must be dealt with vigorously. No class of infectious people are so difficult to deal with as the syphilitic or the gonorrheic; first, because he or she so rarely goes to the doctor until late in the progress of the disease, in syphilis usually not until the initial sore has occurred often three weeks after infection, and in gonorrhea not until the prescriptions of his friends or the recommendations of a prescribing druggist have been tried and failed; second, when the doctor does see him or her it may be that no record of the case will ever reach the health department. There is a well established medical tradition against reporting "secret" diseases, the law to the contrary notwithstanding, and unless the doctor has a social conscience, which is sensitive enough to keep him from conniving at the dissemination of these terrible racial poisons, no report will be made of them and venereal diseases will continue its fearful work unhindered by him. The doctor's help is of great importance, and it is gratifying to note that many of them are now aiding the health department in its control work.

If, however, we were totally dependent upon medical reports, we would be in bad case. The police, the law courts, and the clinicians are our main dependence. From these sources the bulk of our cases come. Our law enforcement division was created in order that the police and other law officers throughout the State may be informed about the law concerning venereal diseases, and when machinery of law is adequate to meet the need, enforcement may proceed without hindrance. Mr. Chas. R. Winfree, our director of law enforcement, has during the past year been very active. His report in the supplement clearly evidences that fact.

The number of investigations are fewer this year than last by reason of the fact that we are short the services of the United States Interdepartmental Social Hygiene Board officer and assistant investigators.

The policy of the department in regard to arrests now is that our officer shall make no arrests, but simply assist local authorities in carrying out their duty in relation to offenses against the venereal disease law.

The greatest single need of the law enforcement division, and I may say of the whole bureau, is adequate provision by the State for the treatment and vocational guidance of delinquent, diseased women. Ivakota is always full to capacity. The arrest of a venereally diseased woman, therefore, nine times out of ten means confinement in jail if the law is carried out. That the State should do no better by its weak, sick and unfortunate women, than to compel them to accept the jail and jail fare without treatment while in quarantine is a sad commentary upon our social organization and a shame to our civilization. As a bureau staffed by Christian men and women, we cannot go much farther in law enforcement upon these people than we are now going until this reproach is removed.

3. INSPECTIONS.

Capt. G. M. Gilkeson, State inspector of hotels and convict camps, has during the past year visited every hotel coming within the limitations of the definition imposed by law, namely, "an inner public lodging house of more than ten bedrooms where transient guests are fed or lodged for pay." To many of these he has made two or three visits. He reports improvement in many places and a generally co-operative spirit on the part of proprietors. He has had to prosecute in some cases in order to force compliance. Two hundred and seventy-two hotels have been visited. One hundred and fourteen received gilt certificates, 28 received silver certificates, 5 received red certificates, and 1 received plain certificate, leaving 124 not certified. The reduction in the number of certificates indicates a closer check than hitherto, but it also indicates that there are a large number of proprietors who have ceased to care for certification. The following changes in the law are asked in order to better deal with the situation:

> First, that the definition be changed to take in any public lodging house of five rooms and over. This would necessitate at least one more inspector.
>
> Second, that the fee for inspection be removed.
>
> Third, that all managers or proprietors be subject to prosecution immediately after violation of law is observed instead of after written notice as now.

The hotel law amended in the above particulars is herewith submitted for consideration by the State Board of Health.

The convict road camps and lime grinding plants of the State have also been visited by the inspector and the detail of conditions found follows in the supplementary reports. The practice, which has been subject of report for two years, on the part of the road authorities of moving camps without notification of this department that such move is contemplated and without seeking advice from our inspector as to certain sanitary observances necessary continue to put many camps under the handicap of making new construction after our inspector arrives, as well as jeopardizes the health of the convicts in the meantime. Why this unwise and dangerous practice is continually repeated is one of the mysteries. A card from the Superintendent of the Penitentiary, or the Highway Commissioner's office, to this department at the same time the sergeant is notified to move would be all that is necessary to insure a visit from and the aid of our inspector in providing a suitable and sanitary camp.

From the standpoint of the health of the prisoners in these camps, the practice of sending prisoners from the jails to the road camps without previous examination by a doctor is a danger to which the convicts should not be subjected. Practically all epidemics among these camps come from these contacts. Great care is taken to examine, to vaccinate and treat convicts, all the result of which is in danger of being nullified by placing dirty and diseased jailbirds among them.

It would seem the part of wisdom to segregate the jail prisoners in special stationary camps or quarries and make provision for seeing that they are not a source of infection to each other. This bureau is prepared to aid in every way in its power in working out plans for correcting the present unsatisfactory conditions in this regard.

*The table accompanying Captain Gilkeson's report is illuminating and the question may well be asked why certain camps year after year continue to score so low. The inspector has no power to enforce the law upon the sergeants of the camps. He can only tell them what they should do and trust the Penitentiary and road authorities to compel the observance. In the case of some camps the influence of the authorities seems to have had small effect.

4. GENERAL HEALTH WORK.

The assistant commissioner has always been charged with emergency epidemiologic work. In carrying out this duty, he responds to the calls from local boards of health for advice in dealing with infectious disease difficulties such as attend smallpox, typhoid fever, diphtheria, scarlet fever and infantile paralysis control work. Rather less than usual of this sort of advice has been necessary this year, for county and town boards of health are becoming more and more proficient in meeting the needs of the local situation. Many boards of health, however, still function poorly, and there is decided need for another physician to be attached to the State Board of Health's central staff who can devote more time to visiting and stimulating efficiency in the control of infectious diseases.

The usual amount of lecture work has been done by the assistant commissioner during the year, and many conferences have been held with town, county and State authorities in regard to health problems. Great interest has always been manifest at these meetings.

The rural life conference called by the Governor in May stressed with great emphasis better health as an essential of community progress and prosperity. The report on rural health at that conference, prepared by Prof. C. D. Hart, of William and Mary College, in co-operation with other interested health workers, offered a program which, if carried forward progressively, will go far towards solving the worst of the farmers' difficulties.

There is no question but that the public health idea is growing rapidly, and I believe that for the almost immediate future we may expect with confidence a great awakening in Virginia.

Respectfully submitted,

ROY K. FLANNAGAN, M. D.,
Assistant Health Commissioner.

---

*A conference with the Penitentiary Board and the State Highway Commissioner and the State Board of Health has been held since the above was written and thorough co-operation is assured.

Co-Operative Unit No. 1.

ALBEMARLE COUNTY HEALTH DEPARTMENT.

DR. WM. S. KEISTER, *Director.*

Prior to the end of our unit year, a special campaign was inaugurated by the Albemarle Medical Society for the continuance of the work and the consolidation, if possible, of the county health work with that of the city of Charlottesville and the laboratories and out-patient department of the University of Virginia.

The plan as regards the city of Charlottesville has not as yet been consummated, but a large body of enlightened sentiment in the city favors it.

The laboratories and the clinics held in connection with the University hospital, however, are by grace of the medical department of the University, definitely a part of the equipment of the Albemarle health unit. This comprises laboratory diagnosis and free clinical service in child hygiene such as eye, ear, throat and orthopedic work and general medical advice to parents in respect to defective children. The highly efficient venereal disease clinic at the University hospital also functions with our health department.

Medical professors and students in the medical school are collaborating with us in the development of diagnostic and curative clinics throughout the county.

The Charlottesville city school board has appropriated $300.00 towards the county health work in order that the children in the city schools both white and colored may have the advantage of State Board of Health inspection and supervision.

An intensive tuberculosis survey is now being conducted in the county through collaboration with the bureau of tuberculosis education of the State Board of Health. Extra nurses have been provided by the bureau, and with the hearty co-operation of the county medical society much good is expected to result. Special tuberculosis clinics have been held in different parts of the county and the nurses are carefully following up the cases. It is expected that in the coming year stated tuberculosis clinics will be a regular part of our health program. The State tuberculosis sanatorium (Blue Ridge) near Charlottesville has been of invaluable aid in both diagnosis and treatment of Albemarle county cases.

Health exhibits displayed at the Keswick (Albemarle) fair attracted much favorable attention, and the first aid station conducted by the nurses there was in requisition for five accidents that occurred. Much health literature was also distributed.

A dental clinic is now being organized from which great things are hoped.

SUMMARY OF WORK PERFORMED.

October 1, 1920, *September* 30, 1921.

(A) Sanitation:

Homes surveyed	795
Other surveys	194
Total sanitary privies and septic tanks constructed	396

Complaints investigated		68
Revisits		884
Advice given		55
(B) Disease control:		
Specimen containers distributed		171
Specimens examined		46
For intestinal parasites	20	
Throat culture	1	
Widal	2	
Wasserman	4	
Water	19	
Disease investigations	69	
Vaccinations		485
Smallpox	330	
Typhoid fever	53	
Whooping cough	93	
Hay fever	9	
(C) Educational:		
Lectures		186
School talks by director		37
Bulletins distributed		6,416
Circular letters and post cards		3,503
Newspaper articles		28
Handbills		500
(D) Campaigns:		
Tuberculosis seal sale		1
(E) School inspection and nurse activity:		
Schools visited		2
Pupils inspected		5,184
Notices sent to parents		1,549
Treatments induced outside of clinics		761
Talks by nurse		154
Treatments or dressings by nurse		69
Conferences attended		233
Home nursing classes and hygiene		15
Home visits		2,551
Health leagues organized		11
Tooth brushes distributed		43
(F) Clinics:		
Tuberculosis—number examined		225
Total clinic patients		225
Dental—patients treated		155
(G) Miscellaneous:		
Special meetings and conferences		1,262
Additional funds secured		$4,472.61

Co-Operative Unit No. 2.

TAZEWELL COUNTY HEALTH DEPARTMENT.

HERMAN W. SNIDOW, *Director.*

Tazewell county, the field of operations of Virginia Unit No. 2, comprises an area of 531 square miles and has a population of 26,035 people, of which approximately nine-tenths are white and the remainder colored. The county as a whole is very uneven in topography, consisting of alternating hills and narrow valleys, the inclines of which are very steep and irregular. The southern and eastern portions of the county are for the most part cleared and set in blue grass, while the northern and western sections, comprising some of the principal coal lands of the State, are still mainly uncleared, with the exception of the premises of mine operations. Coal, timber and export cattle are the chief products, and, together with agriculture, comprise the total industries.

ORGANIZATION

Local appropriations for a county health department were made during July, 1920, however, the co-operative International Health Board and State Board of Health unit was not started until March 1, 1921. As a result of the proposed unit, Miss Margaret Lambert, Red Cross nurse, began work alone in the county August 1, 1920, and continued as an individual worker until the opening of the complete Tazewell county health department on March 1, 1921. On this latter date, the complete organization was started with Herman W. Snidow as health officer in charge, and W. Gilbert Cline as assistant health officer. On June the first, after the organization of the county for systematic sanitary work, W. H. Edwards, Jr., sanitary engineer, and S. F. McMahon, sanitary inspector, were added to the unit. On this latter date the services of Miss Edith Crockett as office assistant were also secured.

EMERGENCY WORK.

The first problem to demand the entire attention of the health officer and assistant was a widespread epidemic of smallpox prevalent throughout the greater portion of the country. At the time twenty cases were known to be existent, while it was suspected that quite a number were in hiding.

The chief areas affected by smallpox were the coal mining settlements in the north and western portions of the county. These comprise Pocahontas, Matz, Red Ash, Seaboard and Coaldan. In the most of these camps, the houses were found to be rather poorly constructed, and for the most part overcrowded, which rendered the isolation of infectious disease patients in families almost impossible, and, therefore, the quarantining of whole families, and often two families living in the same house, were necessary.

During the month of May compulsory vaccination was secured at four of the coal mining settlements: Seaboard, Coaldam, Red Ash and Matz (Pocahontas was already enforcing such a measure). This was made possible through having coal operators and superintendents of operations issue notices refusing to employ, continue in employment, or permit to occupy their houses, any person who could not show a health department or doctor's certificate of successful vaccination within a period of limited number of days. The health officer and assistant, together with the resident physician at each of the camps mentioned, followed up these proclamations with free administration of vaccination in a house to house canvass until approximately ninety to ninety-five per cent. of the total inhabitants were vaccinated and the remainder were forced to vacate.

In dealing with this smallpox situation, the chief aim of the Health Department was to avoid quarantine as much as possible and to secure instead wholesale vaccination. In cases where smallpox occurred in homes constructed so as to permit of complete and satisfactory isolation of patients, quarantines of entire families were maintained only long enough to see that all vaccinations of other members were successful. After this was assured, only the patient or patients, with their nurse, were retained in quarantine, the other members living in isolated sections of the house, were allowed to go at large after thoroughly sterilizing their persons and clothing.

In cases where houses were not constructed so as to permit of isolation of patients, all members of families were retained in quarantine, unless arrangements could be made to have the non-infected members transferred to other quarters after having secured successful vaccinations and after having undergone the usual clean-up.

In each instance of smallpox infection, whether reported or discovered, the health officer and assistant visited the patient or patients, confirmed the diagnosis, quarantined and placarded the premises and vaccinated the members of the household together with as many of the neighboring people as possible. In addition to the above, schools in the vicinity of actual cases were completely vaccinated, public meetings suspended, and such other precautionary measures were taken as seemed advisable.

The chief opposition to vaccination was encountered among the religious sect known as Holy Rollers, of which there are quite a number in the county, particularly in the coal mining settlements. After the death of one member from smallpox who had refused vaccination, and after much argument and persuation, the most of this opposition was reluctantly overcome. It may be noted further that smallpox vaccination was furnished to all people free of charge since the county supplied the vaccine and the members of the Health Department, for the most part, administered it.

During the life of the epidemic for three months after the inauguration of the Health Department, a total of 92 cases were attended, 33 quarantines were established and maintained and 2,050 persons were vaccinated. During this time two deaths occurred from smallpox, one due to refusal of vaccination and the other from physical infirmities rendering it unsafe to vaccinate.

TUBERCULOSIS CLINIC

Through the co-operation of the Virginia tuberculosis association, a four-day T. B. clinic was held in the county, April 26th to 29th, inclusive. The examinations were made at the four principal towns in the county: Graham, Pocahontas, Tazewell and Richlands. A total of 216 people were examined, of which forty-two were found suspicious, three incipient, thirteen moderately advanced, fifteen advanced and eight arrested. The examinations were mostly made by Dr. W. E. Brown, of Catawba Sanatorium; however, part of the time Dr. Brown was assisted by Dr. Roy K. Flannagan, of the State Board of Health, and various local physicians. There was a very marked co-operation on the part of the local practitioners in sending their suspicious cases for examination.

After the closing of the clinic, considerable time was spent by both the nurse and the assistant director of the health unit in following up the results of the T. B. examinations, and urging the infected person to go to one of the sanatoria for treatment. In this line of work, approximately 100 visits were made and assorted sets of T. B. literature distributed. In addition sputum cups were given out wherever needed, also instructions in personal and home hygiene.

As a result of the T. B. follow-up work, eleven patients have been sent to Catawba Sanatorium for treatment and a number of others are persuaded to go as soon as vacancies may occur. Four of the patients sent were personally conducted by the assistant health officer, after his having secured sufficient financial assistance to provide for their going.

NURSE ACTIVITIES—SCHOOL INSPECTION.

Owing to the fact that no very satisfactory co-ordination between the Red Cross nurse work and the Health Department was ever secured, a complete report of the nurse activities is not available. The nurse began her work in the county August 1, 1920, seven months prior to the organization of the complete Tazewell health department. During this period her attention was devoted chiefly to the inspection of school children and the notification of parents. After the organization of the complete health unit, the nurse continued with school inspection together with assisting in the T. B. follow-up work, and such other home visiting as could be accomplished to advantage. A total of 101 schools were visited, comprising 125 visits, 3,845 children were inspected and 2,542 notices were sent to parents. In addition to the above, sixty-six school talks were given and 184 home visits were made.

During April, as a courtesy to the local Red Cross, the nurse was given the complete assignment of organizing a proposed dental clinic for the county. This was reported ready for operation on or about June 1st, or as soon thereafter as a suitable dentist might be procured through the mouth hygiene department of the State Board of Health. Subsequent investigation by the health officer developed that no provisions had been made for either an assistant or an automobile for transportation longer than about four weeks. The clinic was, therefore, called off until those very necessary items might be assured for a period of three months or longer. Having completed her year's work with the exception of two weeks accrued vacation, Miss Margaret Lambert left the employ of the unit on July 15, 1921.

LEGISLATION.

In order to provide a satisfactory basis on which to conduct systematic sanitary campaigns in the county and in the incorporated towns in the county, formal local adoption of the soil pollution rules and regulations of the State Board of Health was deemed necessary. In order to secure this legislation the health officer appeared before the county board of supervisors and before the individual councils of the incorporated towns of Graham, Pocahontas, Tazewell, North Tazewell and Richlands with a request for the formal adoption of the measure. As a result the State board regulations, drafted as a sanitary ordinance for the towns, and an anti-soil pollution law for the county was unanimously adopted by the councils of the five towns in succession and by a majority vote of the board of supervisors for the county.

In addition to the adoption of the ordinance by the towns, the sum of $250 each was secured from Graham, Pocahontas and Richlands, together with $200 from Tazewell and $100 from North Tazewell, supplementing the general appropriation by $1,050 to be used in employing two sanitary inspectors exclusively for town work. This arrangement provided each town with an inspector for a period of from four to six weeks to make the full preliminary surveys and to secure the necessary improvements.

As a result of the previous demonstrations of the virtue of smallpox vaccination, the three district school boards in the county were persuaded to authorize compulsory vaccination of all teachers and school children throughout the county. The Health Department will undertake this work during the months of October and November.

TOWN SANITATION.

Following the adoption of the town ordinances and the appropriation of additional funds as described above, W. H. Edwards, Jr., sanitary engineer, and S. F. McMahon, sanitary inspector, previously mentioned in this report, were secured for the work. Mr. McMahon conducted the campaigns in Tazewell, Richlands and North Tazewell during a four months period, June the first to September the thirtieth. Mr. Edwards was similarly employed in Graham and Pocahontas for three months, from June the tenth to September the tenth.

The campaigns in each of the towns were conducted along the same general lines as follows: First, a personal visit was made by the inspector to each home and place of business within the corporation and a record taken of the families, ownerships of property and general sanitary conditions found. Where sewage disposal arrangements were satisfactory no further action was taken, but in cases where the arrangements were found to be unsatisfactory a thirty-day notice, bearing a copy of the town requirement, was served. In such cases each individual property owner was advised as to the best method of making such improvements as would be commensurate with his location and financial circumstances. After the completion of the preliminary survey and the serving of the necessary notices, the inspector devoted his remaining time to revisits and to helping the property owners secure such labor and materials as were necessary for improvements.

In addition to securing sanitary sewage disposal, the inspector also induced and supervised other clean-up work such as the removal of hog pens and stable filth, together with various accumulations of tin cans and other dry garbage. Drainage ditches and streams within and adjacent to towns were also cleared of impediments and properly trained.

The chief aim of the sanitary inspector during the course of the work in each town was to secure permanent sewerage, wherever at all possible, in preference to simple improvements in privies. In this connection, 5,736 feet of new sewer lines with 188 new connections were secured on a $50 per tap basis in Graham, together with 250 feet of new lines with forty-seven connections in Pocahontas and two connections in Richlands. In addition, arrangements have been made and materials ordered for 1,925 feet of new sewer line for the town of Richlands. This line will collect the individual sewers of thirty-three homes in the town already having open sewers and will also provide for nineteen new connections.

In order to secure satisfactory arrangements in certain localities where sewerage was not practical, seventy-nine septic privies were installed by the Pocahontas Fuel Company in Pocahontas and twenty-four septic tanks by individuals in the town of Tazewell. This latter improvement was secured to overcome a condition in Tazewell where twenty-nine homes within the space of two city blocks were discharging their sewage into a very small open drain flowing through the most thickly settled section of the town.

In general, very satisfactory co-operation was secured in each of the towns and improvements were made without unusual delay. Individual results are noted in the statistical report.

COUNTY SANITATION.

The initial sanitation of Tazewell county, made early in the life of the Health Department, showed such a universal need for sanitary improvement that it was immediately apparent that systematic personal attention could be given only a portion of the field during the present year.

Since it was, naturally, incumbent upon the Health Department to direct its first available energies for sanitary improvement to the localities where greatest menace existed and where the greatest number of people might be benefited, the towns, as previously mentioned, were chosen for initial consideration. This necessitated directing the chief personal attention of the unit to the campaigns already noted under "Town Sanitation."

In order to make it possible for the remainder of the county to receive attention, at least in a selective manner, a special county circular mailing campaign, reference sanitary privies, was organized early in June and is still being conducted. To provide for this, the following necessary steps were secured in order: (1) Adoption of the State Board of Health anti-soil pollution law by the county board of supervisors; (2) A copy of the names and addresses of all property owners taken from the county land records; (3) Correct literature comprising a form letter with the anti-soil pollution law printed on the back, a sanitary survey blank, return envelope and return postcard folder.

Under this arrangement, the circular letters with enclosures are mailed out, and as fast as return surveys are received, indicating the need or the desire of the property owner to make sanitary improvements, personal letters are written and proper literature forwarded immediately. These are followed by personal calls as early as possible.

The mailing out of the above literature was started June the fifteenth and to date 1,200 circular letters with enclosures have been forwarded, out of which 462 return surveys have been received, and 257 privies either constructed new or remodeled to standard.

In inaugurating the circular campaign, the aim of the Health Department has been to extend to all the property owners in the county the opportunity to receive advice and assistance in the matter of constructing sanitary sewage disposal arrangements. The results to date have demonstrated that a very appreciable number have taken advantage of the opportunity and have constructed sanitary privies, which, not only benefited the property owners, but will serve as actual demonstrations in later and more intensive rural work.

SCHOOL SANITATION.

Early in the season the assistant health officer made a sanitary inspection of a number of school houses located in each of the three different school districts of the county. It was found on this inspection that the great majority were in need of sanitary improvement. This condition was reported to the three district school boards in three consecutive meetings and authority was granted the assistant health officer by two of the boards to make improvements at six different schools in each of their districts. These comprised all rural schools, and the improvements consisting of building new or remodeling old building into sanitary pit privies.

In addition to the above, and on the recommendation of the Health Department, two of the principal white town schools (Pocahontas and Richlands) and one of the larger town colored schools (Pocahontas) have been provided with up-to-date toilet equipment and sewerage.

School sanitation is still being pushed by the unit and improvements will be secured as rapidly as funds may be made available by the school boards to cover the cost of the work.

DENTAL CLINIC

As previously mentioned, attempts were made to organize a school dental clinic early in the season. These proved ineffectual; consequently, it developed upon the Health Department to find some means of providing this very necessary follow-up work.

It was anticipated that the Tazewell county Red Cross would continue their assistance to the county health work by providing the funds sufficient to secure and transportation for the proposed dental clinic as a complement to the school inspection work done by their nurse during the previous year. A strong appeal was made to them along this line by Dr. Isaac Pierce, of the State Board of Health, at their reorganization meeting held at Graham, Virginia, on July the fifteenth. At this meeting, however, the anticipated assistance was declined in favor of a Red Cross executive secretary for social service work outside the jurisdiction of the Health Department.

Neither Dr. Pierce nor the members of the Health Department were satisfied that the action taken at the meeting mentioned represented the actual attitude of the individual Red Cross organization of the county. Consequently, subsequent investigations were made which developed that the three larger Red Cross organizations of the county, Graham, Pocahontas and Richlands, very definitely favored continuation of support of health work. Special meetings were, therefore, held with these three individual organizations with the result that both Graham and Pocahontas voted the appropriation of $500 each and Richlands $100 with a possible additional $100 to the support of the proposed school dental clinic. In addition to this combined fund, it was advised that another $500 would be available from the State Board of Health.

With the above total fund of $1,600 provided, the Health Department has secured the promise of a dentist from the mouth hygiene department of the State Board of Health to undertake the work. A capable assistant together with an automobile for transportation have also been secured, and it is anticipated that the clinic will start under favorable auspices not later than October the fifteenth.

EDUCATIONAL.

During the months of March, April and May, almost the entire time of the health officer and assistant were given to smallpox quarantines and vaccination, consequently, the educational work of the unit during this period was confined entirely to matters pertaining to smallpox and its control. In this connection forty lectures and school talks were given, five newspaper articles written and about 500 bulletins were distributed.

Prior to the starting of the sanitary work, June the first, the health officer spent about two weeks in organizing the incorporated towns of the county for their subsequent sanitary campaigns and in organizing the mailing campaign for the county. In this connection, six lectures were given before the different town councils and the county board of supervisors.

Since the beginning of the sanitary work, ten lectures have been given, two newspaper articles written and about 600 circulars and bulletins have been distributed. In addition, 1,200 circular letters have been mailed, inclosing special literature, and many people have been interviewed, personally, both in the office and at their homes.

ADDITIONAL FUNDS SECURED.

In addition to the original appropriation of $7,833.33 provided for the support of the Tazewell health unit, further State and local contributions and subscriptions amounting to $2,650.00 have been secured. Of the above the towns of Graham, Pocahontas, Tazewell, North Tazewell and Richlands have contributed $1,050 for their respective sanitary campaigns which are now completed. The subscriptions are: $500 from the child welfare division of the State Board of Health for the support of the school dental clinic, together with $500.00 from Graham Red Cross, $500 from Pocahontas Red Cross and $100 from the Richlands Red Cross for the same purpose.

APPROXIMATE EXPENDITURES FOR SANITATION.

(*Period of four months.*)

During the course of the sanitary work in the towns, schools and county, a total of 7,711 feet of new sewer lines have been contracted and, for the most part completed, including a total of 257 new connections. In addition, 474 new privies of pit and pail type have been constructed; 241 old privies have been improved, and 103 septic tanks have been installed. Together with the above, 238 homes have been equipped with modern inside toilets, seventy-nine new privy houses for septic privies are under construction and three schools have installed modern fixtures.

Considering the cost of sewer lines covered by the $50 per tap charges made to all new connections, a total of $12,850 has been contracted. Approximating the cost of inside toilet installations at $100 each, a total expenditure of $23,800 is involved. The average cost of septic tanks was $70 each, therefore, a total of $7,210 has been expended in this manner. The average cost of new privy is $20, and the average cost of improvement in an old privy is $10, therefore, privy improvements together with new houses for septic privies may be estimated at a total of $13,470. The modern improvements in the three schools mentioned, we are advised, amounted to approximately $1,500. The total of the above amounts, both definite and approximate, would indicate that approximately $58,830 has been contracted or paid out for sanitary improvements. In addition, $1,050 has been paid by the towns for inspection, which brings the total amount to $59,880, the approximate expenditures for sanitary improvement induced by the Tazewell health unit during a period of four months.

REMARKS.

In general, the co-operation of the Tazewell county people has been very satisfactory. Particularly has this been true of the town councils of the towns covered in the sanitary campaigns and of the physicians throughout the county.

Transportation has doubtless proven itself to be more costly in Tazewell county than ordinarily. This is due to the large area and the extreme uneven topography with the corresponding steep and rough roads.

SUMMARY.

(*Statistical Report*)

Smallpox:	
Number cases attended	92
Number quarantines established—maintained	33
Number vaccinations	2,050
Tuberculosis Clinic:	
Number persons examined	216
Number found infected (positive and suspicious)	73
Number sent to sanatoria	11
School Inspection:	
Number schools visited	101
Number visits to schools	125
Number children inspected	3,845
Number notices sent to parents	2,542
Number school talks by nurse	66
Number homes visited	184
Number pupils found—defective hearing	39
defective vision	556
defective teeth	1,571
nasal obstructions	560
enlarged tonsils	699
malnutrition	346

Town Sanitation:

Graham—

Number surveys made	489
Number revisits	874
Number approved first survey	199
Number condemned first survey	290
Number linear feet new sewer lines constructed	5,736
Number sewer connections secured	188
Number new privies constructed	81
Number not completed	21

Pocahontas—

Number surveys made	445
Number revisits	150
Number approved first survey	291
Number condemned first survey	154
Number linear feet new sewer lines constructed	250
Number sewer connections secured	47
Number septic tanks installed	79
Number new privies constructed	26
Number not completed	2

Tazewell—

Number surveys made	220
Number revisits	212
Number approved first survey	98
Number condemned first survey	122
Number sewer connections secured	1
Number septic tanks installed	24
Number new privies constructed	91
Number old privies made safe	6

North Tazewell—

Number surveys made	90
Number revisits	45
Number approved first survey	21
Number condemned first survey	69
Number new privies constructed	52
Number old privies made safe	14
Number not completed	3

Richlands—

Number surveys made	218
Number revisits	306
Number approved first survey	33
Number condemned first survey	185
Number linear feet new sewer lines constructed	1,925
Number sewer connections secured	2
Number new privies constructed	103
Number old privies made safe	61
Number not completed	19

County Sanitation—	
Number notices and survey blanks mailed	1,200
Number surveys secured	462
Number new privies constructed	97
Number old privies made safe	160
School Sanitation—	
Number schools inspected	18
Number approved	2
Number condemned	16
Number privies constructed (12 schools)	24
Number schools provided with sewerage	3

Additional funds secured—	
Graham—for sanitation	$ 250 00
Pocahontas—for sanitation	250 00
Tazewell—for sanitation	200 00
North Tazewell	100 00
Richlands—for sanitation	250 00
State Board of Health—for dental clinic	500 00
Graham Red Cross—for dental clinic	500 00
Pocahontas Red Cross—for dental clinic	500 00
Richlands Red Cross—for dental clinic	100 00
Total	$ 2,650 00
Original appropriation	7,833 33
Total fund to date	$ 10,483 33
Approximate expenditures for sanitation (period four months)—	
Towns for inspection	$ 1,050 00
Individuals for sewer connections	12,850 00
Individuals for inside toilets	23,800 00
Individuals for new privies	9,000 00
Individuals for old privies improved	2,410 00
Pocahontas Fuel Company for septic privies	5,530 00
Pocahontas Fuel Company for privy houses	1,580 00
Individuals for septic tanks	1,680 00
Schools for new privies	480 00
Schools for sewerage and modern fixtures	1,500 00
Total	$ 59,880 00

Co-Operative Health Unit No. 3

HENRY COUNTY HEALTH DEPARTMENT.

DR. E. C. HARPER, *Director.*

October 1, 1920—*June* 15, 1921.

On June 15, 1920, the director and his inspector arrived in Henry county. Henry county is located in the Piedmont section of Virginia. Its area is about 400 square miles. The present population is about 20,000. Martinsville, the county seat, is the only town of any size, its population being about 3,500. Tobacco is the principal crop which is raised extensively in all parts of the county. The good roads movement has resulted in sixty-seven miles of improved roads to date.

In the summer of 1912, Dr. W. A. Brumfield conducted a hookworm clinic in this county. His work made a very favorable impression on the people, and he made some remarkable cures. This in all probability was responsible for the subsequent health work that was started here in the fall of 1919 by Mr. E. C. Stoy, United States Public Health Service, who through his untiring efforts in an educational campaign, succeeded in getting a $5,000.00 appropriation from the city to finance the unit from June 15, 1920, to June 15, 1921.

Prior to the organization of the unit, a Red Cross nurse had been in the county for about six months; this nurse then became a part of the unit staff.

Believing that the foundation of all permanent health work rests on proper installation of the basic principles of health and cleanliness without undue antagonism, we decided to lay greater emphasis on the more popular phases of the work, such as child welfare and life extension, at the beginning and push the less popular, but vitally needed sanitation, later on. An educational campaign of illustrated lectures, conferences and a wise distribution of health literature was organized. In July a dentist was employed and portable dental equipment secured. The nurse assisted the dentist in cleaning the teeth. Five hundred and twenty-one school children received much-needed treatment.

Tuberculosis clinics were held at five points in the county in August and 235 people were examined. Twenty cases were discovered, the most of whom have received sanatorium treatment. School inspection began with the opening of the schools, and in practically every school competitive health leagues were organized. Several classes in home nursing were also organized among the school girls.

There were insanitary privies, or none at all, in seven and five-tenths per cent. of the county schools. Funds were given by the school board and work on the school privies started. By January 1, 1921, seventy-four per cent. of the schools had been sanitated. The remainder were to be sanitated in the spring, but so far the school board has not been able to make the necessary appropriation. Great stress has been laid on permanent installation and wherever possible a septic tank or privy has been installed. Our second choice has invariably been the pit privy, for it comes nearer meeting the purse of the poor family than any other type.

A tonsil and adenoid clinic was organized at a local hospital. Twenty-one boys and girls of school age from poorer families were operated upon with beautiful results in every case.

Tobacco is the principal crop of Henry county, and prices were so low this year that the supervisors would only make a $1,500 appropriation for the continuance of health work during 1921-22. This with what the State and United States Public Health Service can supply only allows for the employment of a sanitary inspector. Dr. Harper's assistant has been employed under United States Public Health Service supervision. The local chapter of the Red Cross, however, has provided for the employment of a school nurse during the school term.

SUMMARY OF ACTIVITIES.

(A) Sanitation:	
Homes surveyed	1,045
Other surveys	26
New privies constructed	803
Septic tanks constructed	52
Water supplies improved	11
Nuisances abated	14
Complaints investigated	46
Revisits	95
(B) Disease Control:	
Specimen containers distributed	235
Specimens examined	285
Disease investigations	223
Vaccination, smallpox	441
Patients sent to hospitals	37
Homes screened	22
Patients treated for intestinal parasites	41
Patients sent to hospitals	37
Homes screened	22
(C) Educational:	
Lectures	23
Bulletins distributed	5,189
Health signs posted	553
Circular letters	2,504
Business letters	1,473
Newspaper articles	35
(D) Campaigns:	
Rat—Rats collected	12,000
(E) School Inspection:	
Schools visited	196
Pupils inspected	2,248
Notices sent to parents	1,076
Treatments induced outside of clinics	106
Talks by nurse	194
Groups organized by nurse	96

	Visits to homes	920
	Tooth brushes distributed	208
	Christmas stockings prepared and delivered to poor children	50
(F)	Clinics.:	
	Dental treatments	521
	Tuberculosis examinations	235
	Tonsil and adenoid patients treated	21

BUDGET.

June 15, 1920—*June* 15, 1921.

Henry county	$ 5,000 00
State Board of Health	2,500 00
International Health Board	2,500 00
United States Public Health Service	300 00
Total	$ 10,300 00

ADDITIONAL FUNDS SECURED.

Dental clinic	$ 700 00
Material for health leagues for schools	75 00
Food for destitute families	50 00
American Red Cross for nurse	375 00
Fieldale Cotton Mills for industrial nurse	750 00
Sanitation for rural schools	400 00
Sanitation Martinsville water shed	300 00
Commercial septic tanks, Bassett Furniture Company	1,000 00
Tonsil and adenoid clinic	50 00
Sanitary improvement, town of Ridgeway	50 00
Child health fairy performance	50 00
Total	$ 3,800 00

Respectfully submitted,

E. C. HARPER, M. D.,
County Health Director.

Co-Operative Unit No. 3

WISE COUNTY HEALTH DEPARTMENT

DR. W. R. CULBERTSON, *Director.*

Prior to the reorganization of the Wise county health department, there had been in operation since November, 1919, a full-time clinic for the treatment of venereal diseases with Dr. W. R. Culbertson in charge. The Federal appropriation not being available after July the first, the work is being carried on as part of the campaign of the county health department.

The health organization as it now exists began to function June the fifteenth with Dr. W. R. Culbertson in charge and financed by the State Board of Health in co-operation with the International Health Board and the county of Wise. In addition the United States Public Health Service participates to the extent of three hundred dollars per annum. The county's part is supplemented by the Virginia Coal Operators' Association, the Red Cross and the Stonega Coke and Coal Company.

SANITATION.

The town of St. Paul has awarded contract for a complete water and sewer system. The water is to be taken from Clinch river and filtered. The sewerage empties into the river about one half mile below the intake of the water supply.

The town of Coeburn has let its contract for water and sewer systems, the water system being furnished from deep wells and pumped to a reservoir. The sewerage will empty into Guest river about one mile below the town.

The town of Wise has also made a survey and estimates for a gravity supply in Stone mountain four miles away. The department has recommended as alternative plans:

1. To take the water from Guest river, filter and pump to reservoir, a distance of approximately 11,000 feet.
2. To take water from Bear creek by constructing a dam with a pool approximating 30,000 gallons, filter and pump a distance of about 9,000 feet. A system of sewers will be installed.

A survey of the town of Wise was made during July and the following conditions found:

Number homes surveyed	203
Number unsanitary privies found	136
Number homes with no privies	10
Number houses with sewers	35

The sewers were merely a drainage into the alleys and not meeting the legal requirements.

A survey has been made of the school buildings of the county numbering 105, and authority from the school superintendent for installing necessary equipment in all buildings in one district.

In the rural sections we have accomplished the following:

Homes surveyed	96
Re-surveys	22
Sanitary privies	18
Water samples examined	10

DISEASE INVESTIGATION.

During July and August, the health officer encountered a rather severe epidemic of smallpox in one part of the county which had existed for ten months. This, by persistent quarantine measures and vaccination, has entirely disappeared. Quite a number of cases of diphtheria and scarlet fever have also developed, but are now under control.

Working in co-operation with Dr. W. A. Brumfield, we have treated and examined 817 persons for intestinal parasites.

SUMMARY OF WORK PERFORMED.

June 15, 1921—*September* 30, 1921.

(A) Sanitation:		
Homes surveyed		367
Schools surveyed		105
Total sanitary privies and septic tanks constructed		25
Complaints investigated		21
(B) Disease Control:		
Specimen containers distributed		467
Specimens examined		638
For intestinal parasites	433	
Wassermann	197	
Water	8	
Treatments given		2,188
Venereal	1,371	
Intestinal parasites	817	
Disease investigations		13
Vaccination, smallpox		101
Number quarantined		90
(C) Educational:		
Lectures		58
Bulletins distributed		11,735
Health signs posted		138
Circular letters		512
Newspaper articles		26
Handbills		1,275
(D) Campaigns:		
Clean up		1
Sewerage		3
(E) School inspection and nurse activity:		
Schools visited		19
Pupils inspected		827
Notices sent to parents		726
Pupils excluded for contagious disease		84
Improvement in school equipment induced		6
Talks by nurse		42
Homes visited		448

The health work of Wise county promises quite favorable results during the year.

Respectfully submitted,

W. R. CULBERTSON, M. D.,
Director.

Malaria Control Work

June 15, 1921—*August* 1, 1921.

E. C. HARPER, M. D., *Director*.

The towns of Hilton Village, Hampton, Lawrenceville, Windsor, Williamsburg, and Chincoteague were visited, surveyed and estimates of expense of elimination of mosquitoes placed before councils and influential citizens. Five towns were visited at the request of local health authorities and advice and assistance given.

A county-wide malaria survey of James City county was begun by Dr. T. H. D. Griffitts, United States Public Health Service, July the first under the immediate supervision of Professor C. D. Hart, county health officer of James City county. The plan was to collect data on malaria incidence in every home in the county with hopes that some satisfactory and economical plan could be worked out for rural malaria control. At the same time the people visited were shown and advised how they could best rid their premises of these disease-carrying pests. Two students from the School of Public Health, William and Mary College, were used for survey work. The same kind of survey was started in Isle of Wight county on July the fifteenth. Considerable interest has been shown by the people in surveyed districts, many having screened their homes and drained or filled breeding places near their residences.

A survey of Lake Prince in Nansemond county, the proposed site of the reservoir for the city of Norfolk, was made to determine what effect, if any, the impounding of water would have on the malaria rate in the vicinity of the pond. Certain recommendations for changes in the plans of clearing were made to the city of Norfolk with the idea of reducing the mosquito hazard as much as possible.

With the co-operation of the Richmond health department all fountains, reservoirs and lakes in the city were stocked with a top-feeding minnow, the Gambusia Afinis. The experiment was so successful that a hatchery is being established to furnish minnows to any community in the State that wants them. They are natural enemies of mosquito larvae and do a great deal of good in selected places.

The following is a report of work completed in Isle of Wight county to date:

Number of homes surveyed	770
Population surveyed	3,588
Number of bulletins distributed	1,237
Number of screening circulars distributed	940
Number of conferences	31
Number of lectures	9
Number of newspaper articles	3
Number of houses screened as result of visit	13
Oiling induced at homes	4
Blood cultures taken	3
Number of mosquito and screening exhibits	5
Number of cases of malaria found	201

Number of special investigations made by request	8
Number of homes surveyed	770
Number of homes found with malaria (1920-21)	140
Per cent of homes with malaria	18
Population surveyed	3,588
Number of cases of malaria	201
Per cent of population with malaria	5.6
Per cent of homes with malaria within one mile of swamp or pond with anopheles breeding	94
Per cent of malaria in homes without screens or only partly screened	88
Per cent of malaria in homes fully screened	12
Per cent of homes fully screened	25
Per cent of homes partly screened	42.5
Per cent of homes without any screening	32

During the year 4,146 cases of malaria were reported to the State Board of Health by physicians of the State. Forty-two deaths occurred, thirteen white and twenty-nine black.

Co-Operative Unit No. 6

FAUQUIER COUNTY HEALTH DEPARTMENT.

T. J. Robinson, *Director*.

Herewith is a statistical report of the activities of the Fauquier health department for the fiscal year, 1920-21:

It is impossible for me to give a detailed report of these activities at the present time. I expect, however, to get out a report in pamphlet form soon, which I will send you.

I would call your special attention to the clinics which we have held in this county and the defects which have been corrected.

You will remember that the record of our tonsil and adenoid clinic was such as has never been made in the State of Virginia, nor as far as records show, in the United States. The home of Dr. S. M. Maphis was converted into a hospital, his offices into operating rooms and two rooms across the street in the Municipal Building transformed into wards, and ninety-four patients operated upon and cared for during two days of the clinic.

I am told by the executive secretary of the Virginia Tuberculosis Association that our tuberculosis clinic led the State.

The soil pollution campaign which has been carried on in this county continuously since the beginning of our work in October, 1920, has resulted in the construction of 2,543 sanitary privies and the installation of forty septic tanks.

Weekly dental clinics were held each Friday afternoon from the first of October to May, utilizing the services of the four local dentists in the town of Warrenton.

There was also a clinic held for the colored school children. This was conducted by Dr. L. A. Fawlkes, a colored dentist from Newport News. About 250 of the colored school children received dental attention from him.

I am pleased to call your attention to the fact that we started out with a budget of $7,300.00, whereas, we have spent $11,402.58, and still we are not in debt.

This so far as the general work is concerned. Following is a detailed report on the special work done by the Fauquier health department in Warrenton, the county seat, for the eight months' period beginning February the first and ending September the thirtieth, which has been presented to the mayor and councilmen of Warrenton:

SANITARY SURVEY.

Immediately following your appropriation of $16.66 2/3 per month for public health work in the town, a survey was begun of the homes and business houses in order to ascertain their needs along the line of sanitation and public health protection. Every home and business house was visited and their premises inspected by a member of the health department, who was competent for such service. It is needless to undertake to describe the findings of this survey. Suffice it to say that some of the discoveries were astounding and should not be allowed to exist where there is human habitation.

ORDINANCES INTRODUCED.

Upon the completion of the sanitary survey of the town, it was decided that the most immediate need was the abatement of nuisances and some provision for the sanitary disposal of human excreta, therefore at the regular meeting of the town council on March 1, 1921, two ordinances were introduced. One, providing for the safe disposal of human excreta; one defining a nuisance and providing for the abatement of same.

ORDINANCES ADOPTED.

At a called meeting of the town council on the ninth of March, 1921, the above ordinances were adopted to become effective, April the first and the fifteenth, respectively. These ordinances have had a very satisfactory effect. Because of the nuisance ordinance many conditions, such as gutter drainage, open sewers, overflowing cesspools, filthy and odorous hog pens, etc., which were obnoxious both to the eye and the nostrils, and detrimental to the public health, have been remedied.

As a result of the ordinance providing for the safe disposal of human excreta, there have been installed in the town of Warrenton one hundred and sixty-five sanitary privies of the box and can type, which are visited once every week by an efficient scavenger, the cans disinfected with a solution that is strong enough to kill bacteria and the contents carried to the town lot and buried. A large number of homes that had water closets and the disease breeding privy have discontinued the outside privies, and after they were thoroughly cleaned had them nailed up so they could not be used.

CLEAN-UP WEEK.

While making a survey of the town, we discovered that there was quite an accumulation of trash, garbage and refuse in some of the alleys, on vacant lots and at a majority of the houses. Realizing that such accumulations were hotbeds for disease-breeding germs, and the necessity of removing same from the town, we designated the period of April the fourth to ninth which was to be known as "Clean-Up Week." During this period such accumulations were to be collected and placed in a convenient place where the wagons and trucks could collect and remove same to the town lot. Posters were printed announcing "Clean-Up Week," and through the aid of the Boy Scouts were placed in every home and business house in town. A canvass of the business houses was made soliciting wagons and trucks for the removal of these accumulations. Every business house that was called upon, with the exception of one, responded admirably, and as a result of "Clean-Up Week" more than two hundred wagon and truck loads of garbage, trash and refuse which had been accumulating for years, were removed to the town lot.

INSPECTION OF FOOD ESTABLISHMENTS.

The food establishments of the town, more especially the restaurants and meat markets, have been inspected at frequent intervals and recommendations offered for the improvement of same when necessary. Some of them now are in good condition, some fair, and some are not satisfactory.

During the past eight months about five hundred pounds of meat have been condemned as unfit for human consumption.

COMMUNICABLE DISEASES.

Since the health work was begun in Warrenton, there have been reported to the office of the health department, two cases of scarlet fever and two cases of typhoid fever which existed in the town. If there were others, they were not reported. The scarlet fever was immediately quarantined and watched carefully until danger of contagion was over.

PHYSICAL EXAMINATION OF SCHOOL CHILDREN.

Every child in the public schools of Warrenton, both white and colored, has been given a thorough examination for physical defects. Many defects were found and many have been corrected.

CORRECTION OF PHYSICAL DEFECTS.

From October 1, 1920, to May, 1921, a dental clinic was maintained by the health department and conducted each Friday afternoon by Dr. J. O. Hodgkin and his two sons and Dr. F. C. Hodgkin. A large number of Warrenton children attended these clinics and had their teeth put in good condition at no cost to them or their parents.

During the month of August, a dental clinic was held at the colored school building in Warrenton, from which many of the colored children received benefits. This clinic was conducted by Dr. L. A. Fawlkes, a colored dentist from Newport News, Va.

At the tuberculosis clinic, which was held in the office of the health department, on June the fourteenth, there were thirty-eight of the Warrenton people, both old and young, examined. Some unsuspected active cases of tuberculosis were discovered. On account of the crowded condition of the State sanatoria, these cases are being treated at home, and doing nicely, one especially is well on the way to recovery.

At the nose and throat clinic held in Warrenton on July the fifteenth and sixteenth, there were fifteen of the boys and girls of Warrenton, both white and colored, operated on for tonsils and adenoids.

In addition to the above, this department has taken ten indigent patients to the hospitals at Charlottesville and Washington for treatment without cost. It has closed up a home, the inmates of which had been parasites on your community for years, because of the feeble-minded mother, placed two boys in the Children's Home Society at Richmond and the mother with her own people in another town.

The above facts are referred to in order that you may understand that the activities of this department have not been confined only to sanitation, but that they covered practically every phase of public health work.

WATER SUPPLY.

It has been the policy of the health department for the past year to send samples of the town water supply at frequent intervals to the State laboratory for bacteriological examination, and until the present well was put in use early in the summer, the reports were always satisfactory. Since that time the unsatisfactory character of the supply has been the subject of so much discussion as to need no comment. Every report that has been made on samples taken directly from the well shows gas formation B coli and that it contains over 2,000 bacteria per c. c., which renders it entirely unfit for human consumption, and he who drinks it in its present condition is inviting disease and death. The laboratory reports on the water supply are open for inspection and examination at the office of the health department at any and all times during office hours.

[Since the above was written, apparatus has been installed to chlorinate the supply until a new source is obtained.—Ed.]

FINANCIAL REPORT.

APPROPRIATIONS.

Compensation for public health work, at $16.66 2/3 per month for eight months	$ 133 33 1/3	
For purchase of boxes and cans	746 60	
For freight on cans	34 20	
Received from scavenger service, installation and sale of boxes and cans	1,458 45	
		$2,372 58

DISBURSEMENTS.

For labor during "Clean-Up Week"	$ 12 15
For hose hire, scavenger wage, labor on cart	535 01
For disinfectants and freight on same	22 17
For wagon, harness and freight on same	112 50
For delivery of boxes and cans	7 50
For ledgers, record books, miscellaneous	31 75
For payment to town treasurer	616 70
For boxes and cans	746 60
For freight on cans	34 20
	$2,118 58

Cash on hand	$ 19 20	
Amount in bank	101 47	
Eight months, at $16.66 2/3	133 33	
		$2,372 58
Amount due for boxes and cans	$ 7 50	
Amount due for scavenger service	52 52	
Amount due from town council for compensation	16 67	
		76 69

RECOMMENDATIONS.

There are certain matters which should receive serious and careful consideration during the coming year, and I, therefore, make the following recommendations:

1. That a city board of health be appointed immediately and that said board consist of three practicing physicians and two laymen, preferable members of the town council.

2. That immediate steps be taken to remedy the condition of the present water supply. The State maintains an engineering division to give advice and recommendations along these lines and they are subject to call at any time. You should secure their services either direct or through your health officer without delay.

3. That all cesspools and open sewers be discontinued and that all homes provided with water closets be required to install septic tanks, or better still, that the town install three or four septic tanks or Imhoff tanks in convenient sections of the town, with a main sewage line extending to each and require a connection therewith. It is an unquestionable fact that the town of Warrenton is faced with a sewer problem which must be solved at an early date in the interest of public health.

4. That a washing station be established for the scavenger cans.

5. That a public comfort station be established and conveniently located. The place of public comfort stations is to be deplored, and the problem is one which should have the careful consideration of the council.

6. That your trash and garbage service be extended so as to reach all the homes in town at least once each week.

7. That no hogs are allowed to be kept within the corporate limits of the town during the period from April the first to November the first of each year.

8. That the town lot have closer supervision, and that a man be kept there from one to two days of each week, as is necessary, to collect and burn the waste that is deposited there.

9. That the police department be authorized and instructed to assist the health department in collecting delinquent scavenger fees.

CONCLUSION.

This report is submitted to you, gentlemen, as taken from the records of the health department, and such records are open for your inspection and examination at any and all times.

In concluding this report, I desire to express thanks to the mayor and the members of the town council for their time so generously given, and for the whole-hearted support given me during the year and also to the physicians of the town for their hearty co-operation and support.

SUMMARY OF ACTIVITIES FOR THE YEAR.

(A)	Sanitation:		
	Homes surveyed		1,195
	Other surveys		274
	Sanitary privies constructed		2,543
	Septic tanks installed		40
	Privies cleaned		2,380
	Water supplies improved		13
	Nuisances abated		60
	Complaints investigated		154
	Revisits		1,037
(B)	Disease control:		
	Specimen containers distributed		179
	Specimens examined		121
	Disease investigations		148
	Routine treatments given		151
	Patients sent to hospitals		37
	Persons vaccinated and inoculated		578
	Persons examined for tuberculosis		326
(C)	Educational:		
	Lectures given		195
	Bulletins distributed		19,342
	Health signs and placards posted		4,204
	Business letters		2,263
	Circular letters, cards and reports		15,582
	Educational publications		78
(D)	Campaigns		
	Clean-up	5	
	Educational	3	
	Sewerage	3	
	Water	1	
(E)	School inspection and nurse activity:		
	Schools visited		144
	Pupils examined for physical defects		3,214
	Number found with correctional defects		1,993
	Number defects corrected		1,598
	Notices sent to parents		1,908
	Children treated for defective teeth		447
	Teeth filled		1,164
	Number of extractions		298
	Prophylactic treatments		190
	Babies examined at child welfare clinic		27
	Conferences attended		96
	Homes visited by nurse		872
	Neglected children placed in homes		12

ADDITIONAL FUNDS SECURED FOR THE YEAR.

State Board of Health (clinic fund)	$ 500 00
Colored people of Fauquier county	500 00

Town council, Warrenton	$ 133 34
Town council, Warrenton, for the installation of sanitary privies and scavenger service	1,423 75
Private donations for purchase of Ford car for nurse (raised through efforts of nurse)	400 00
Received from dental clinics	445 49
Received from nose and throat clinics	600 00
Private donation (special tuberculosis clinic)	100 00
	$ 4,102 58
Total amount of budget for year	7,300 00
Grand total for year	$11,402 58

Respectfully submitted,

T. J. ROBINSON,

Field Director, Fauquier county,

Field Agent, U. S. P. H. S.

Co-Operative Unit No. 7

HALIFAX COUNTY HEALTH DEPARTMENT.

KOLBE CURTICE, *Director.*

The Halifax county health department was organized February 1, 1920, with Dr. W. A. Newman in charge. Dr. Newman remained in charge of the work until October 30, 1920. Upon his resignation, Mr. Kolbe Curtice was appointed to fill the position.

During the month of November plans were laid before the mayor and council of South Boston to establish a modern scavenger service of the box and can type in the unsewered sections of the town. An ordinance, similar to the one framed by the board of commissioners of Tuscaloosa, Alabama, and recommended by Dr. Lumsden, of the United States Public Health Service, was adopted and put into effect December the first. At the same time an appropriation of $1,700 was made for a rotary fund until the system became self-supporting.

Mr. James Lewin, of Front Royal, formerly with the United States Public Health Service, was made sanitary inspector for the town and upon his arrival took charge of the construction work.

Before the organization of the scavenger service, only a small percentage of the dry toilets in town received the services of a scavenger, and, at its best, this service was very unsatisfactory and insanitary.

Routine inspection of stores, restaurants, warehouses, livery stables, slaughter houses and other public places and private homes were made, and, when necessary, regulations enforced in regard to cleaning up of same.

SUMMARY OF WORK PERFORMED IN SOUTH BOSTON.

Number of homes inspected	650
Number of revisits and routine inspections	2,700
Privies made sanitary (box and can)	510

Privies made sanitary (chemical type)	35
Privies made sanitary (Kentucky type)	67
New privies	110
Pit privies	6
Total cans moved by scavengers, December to August 30th	21,550

(The contents of each can is poured into the sewer and can washed and disinfected.)

Approximately 431 tons of night-soil has been disposed of in a proper way.

WORK IN RURAL COMMUNITIES.

At the January meeting of the board of supervisors and the Halifax County Chapter of the American Red Cross, appropriations were made amounting to $5,000 to carry the health program on for another year beginning February 1, 1921. This amount was matched by the State and International Health Board, thus increasing the organization from an $8,000 to a $10,000 unit.

The director, by request, met the town councils of Virgilina and Clover on March the first and twenty-first, respectively, to consider improving the sanitary conditions of those towns. Owing to the geographical conditions in Virgilina and to the closely settled homes in Clover, it was found necessary to adopt the box and can scavenger service. The aforesaid conditions making it inadvisable to put in the pit-type privy. In each town the cans are cared for on Monday, disposition of the night-soil being made by burying. Virgilina and Clover are towns of less than 350 or 400 population, smaller than towns usually having a scavenger service. This service is, however, in both cases. self-sustaining.

At Scottsburg, a small village, an enthusiastic meeting was held to talk over the best plans for sanitating that place. Two 1,500 gallon working capacity Kentucky-type privies at the high school, several other Kentucky-type privies, septic tanks and pit privies were the outcome of this meeting.

During the year 2,012 surveys were made and of this number, 1,315, or seventy per cent, have been improved. Seventy-five septic tanks and septic privies have been installed at school houses, the cotton mill and private homes.

Forty typhoid fever cases, mostly widely separated, were reported to the office, and in each instance these were followed up by the health officer. Three homes where fever occurred had privies of the open-back surface type, two were on sewer lines and the rest had no pretense of a toilet. However, after explaining to the householder how typhoid is contracted and the importance of the privy in its prevention, no trouble was found in sanitating these homes. Water supplies were improved and typhoid inoculation administered.

Within the past year a total of 266 disease investigations were made with a result of sixty-nine quarantines. Four hundred and twenty treatments of typhoid and 560 of smallpox vaccine were given, forty treatments of diphtheria antitoxin and six of pertussis vaccine were dispensed through the health office. These treatments were secured at cost by those applying.

Tuberculosis clinics were held in South Boston, Clover, Rosa and Virgilina. Dr. T. N. Davis, of Lynchburg, was the clinician. One hundred and forty-five patients were examined and out of this number fourteen positive and three suspicious cases were found. Five in the early stages have been sent to the State sanatoriums.

NURSING ACTIVITIES.

One hundred and twenty-four schools were visited and 3,992 pupils inspected. Two thousand nine hundred and two notices were sent to parents calling their attention to physical defects found, and sixty-six children excluded from school by the nurses owing to communicable diseases found on inspection. Two hundred and seven home visits were made in the interest of defective children.

Dental clinics have been held at Turbeville, Cluster Springs, Aaron's Creek, Calvary, Clarkton, Crystal Hill and North Staunton. Children from preschool age up to and including thirteen years were treated. Considering that this work was carried on during the summer months the following results are most gratifying:

Number examined	213
Number treated	198
Number extractions	167
Number amalgam fillings	449
Number porcelain fillings	6
Number pulps capped	25
Number cleanings	71
Number gutta percha fillings	12
Temporary relief	5

Dr. Hyman Bear, of Richmond, was the clinician in charge of this work during July and August and was succeeded by Dr. J. W. Roberson on September the first. The dentists were assisted by the public health nurses, Miss Draper Fultz and Miss Alice Carson.

During April Mr. Robert B. Nelson, of the bureau of social hygiene, held a series of illustrated lectures on social hygiene at various points in the county.

OFFICE WORK.

Nine thousand three hundred and fifty-five bulletins were distributed, 566 health signs posted, 4,360 business letters and 8,803 circular letters were sent out, 3,120 hand bills were circulated and, through the courtesy of our local papers, seventy-nine newspapers articles were printed. The bookkeeping, collections, etc., connected with the scavenger service in South Boston was attended to by officers of the health department. Reports to the State, Red Cross, town of South Boston, etc., were made out from time to time in addition to the regular routine work of the office. A considerable amount of miscellaneous work along varied lines was also carried on.

Respectfully submitted,

KOLBE CURTICE,
Director of Halifax County.

Report of the Field Service of the United States Interdepartmental Social Hygiene Board

October 1, 1920, *September* 30, 1921.

On October 1, 1920, the field service of the United States Interdepartmental Social Hygiene Board in Virginia was known as the Bureau of Protective Social Measures assigned to the State Board of Health. This bureau was directly responsible for the protection of soldiers and sailors from venereal disease and operated almost exclusively in communities of military and naval importance.

The staff consisted of the supervising field agent, five field agents, three assistant field agents (colored), two full-time stenographers and one part-time stenographer.

The office of the supervising field agent was with the State Bureau of Social Hygiene in Richmond, where he was under the direct supervision of the State Health Commissioner. The other officers were located in Alexandria, Norfolk and Petersburg. It was the duty of the agents to put into operation a program of search, investigation, formulation of reports and presentation of facts for the construction and operation of programs of protective social measures and for the effective enforcing of laws relating thereto by the duly constituted authorities for the protection of armed military and naval forces of the United States against venereal disease. From time to time investigators were sent to various points in the State to make careful reports on vice conditions. When advisable these reports were laid before the proper law-enforcing officials and the necessary action was taken.

An important phase of the program was the case work done with the delinquent girl who either was, or soon would be, a disease carrier. When the fact that our Norfolk office was handling over two hundred of these delinquent girls a month is taken into consideration, the value of this work can be readily seen. In most communities our agents were in very close touch with the courts and were of great assistance to them in the disposition of cases of this kind. Two of our Norfolk agents were appointed as probation officers of the juvenile court.

As an example of the work done by this bureau, I will cite the following instance. Early in the spring many cases of venereal disease, among the soldiers at Langley Field and at Fort Monroe, were reported to the field agent in charge. Most of these infections were received in Newport News. An investigation of this community was made and numerous houses of prostitution were discovered. This condition was caused not through any fault of the city authorities, but because they did not have the proper facilities to handle the inmates of these houses. The field agent in charge was fortunate enough to secure the co-operation of the State health authorities and arrangements were made to have these women quarantined in the Richmond jail. The Newport News authorities were also co-operative and the result was that these houses were closed and the inmates were brought to Richmond where they received the medical attention they were so badly in need of. The venereal rate at the two above mentioned camps was greatly reduced.

Owing to the failure of Congress to appropriate adequate funds, it was necessary to disband the bureau of protective social measures in June. Our limited appropriation now makes it only possible for us to continue one office in the State. This is located at Norfolk, Virginia, owing to the great naval population there. Our work now deals with the large community problem rather than with that of the individual.

The field service of the United States Interdepartmental Social Hygiene Board believes that it has fully justified its existence in Virginia. The success of the work was made possible by the support accorded it by the State Health Commissioner and by the bureau of social hygiene of the State Board of Health.

Respectfully submitted,

WALTER L. PETERS,
Supervising Field Agent.

Report of the Educational Department of the Bureau of Social Hygiene

From January 1, 1921, *to September* 30, 1921.

On January 1, 1921, Dr. Roy K. Flannagan became the director of the bureau of social hygiene of the State Board of Health, and at that time a complete reorganization of the work took place. The educational work was under the direction of the Rev. Robert B. Nelson, who served as the official lecturer for the State, assisted in the organization of the department by Mrs. Edna Fox. The policy pursued was for Mr. Nelson to go into a city for a lecture campaign of from two to four days, according to the population, giving his talks in the public schools, private schools, business men's organizations and groups of men and women, the latter talks to be accompanied by moving pictures. Mrs. Fox traveled ahead of him as advance agent arranging all of the details of these campaigns.

In the first seven months of the work, 206 lectures were given by Mr. Nelson with a total attendance of 43,169 people, covering twenty-six of the larger cities in the State. Besides this lecture work, a systematic distribution of literature is being carried on and up to September 1, 1921, 37,916 pamphlets have been distributed.

Just at present a lecture program covering about a month, from October 17, 1921, to November 15, 1921, is being arranged for Miss M. L. Bain, of the American Social Hygiene Association, whose services have been secured for this time. Miss Bain is to lecture in nineteen cities in Virginia covering practically all of the women's colleges and preparatory schools.

In May, 1921, the department brought Dr. Rachel Yarros, of the United States Public Health Service, down to Virginia for a series of lectures to women. The outgrowth of her two lectures in Richmond has been a splendid social hygiene committee consisting of representative women of the city who expect to attend a course of lectures on sex education by Dr. Margaret Kuyk, of Richmond, after which instruction they will pass the knowledge on in their various home localities. Similar committees were formed by Dr. Yarros in Roanoke, Lynchburg, Danville and Norfolk, each group to carry on the educational phase of this work in a manner best suited to their particular needs.

The department had an exhibit at Ocean View for eight days in August, and is planning a very elaborate exhibit for the State Fair, October 1-8, 1921.

During August and September, 1921, twenty-two cities, in almost as many counties, were visited by the director of education, and in each place a permanent contact for the distribution of literature was made. The people interviewed, and who will handle literature distribution for this bureau in the future, were county nurses, county health officers, presidents of W. C. T. U. organizations, presidents of women's clubs, Red Cross nurses and executives, and in some instances, public spirited private citizens who are interested in the educational work of the bureau of social hygiene. In many of the cities, factories were visited, and arrangements made for lectures, film showings, and distribution of literature among employees. In two of the larger cities permanent committees were organized and a program of work laid out, which means continued local effort being put forth in behalf of this educational work. Arrangements have been made for fifty-seven social hygiene lectures to be given during the next two months by a woman lecturer connected with the American Social Hygiene Association under the auspices of the Virginia State Board of Health.

Law Enforcement

CHAS. R. WINFREE, *Director.*

It is the policy of this division to induce police departments and courts to treat violations of the laws for the protection of the public health in the same serious manner that violations of the laws for the protection of property are now regarded. When cases of violations of these laws are reported to the State office, they are immediately brought to the attention of the local officials, and the services of the bureau of social hygiene are offered in making investigations and securing evidence for the conviction of persons who violate them. So far as possible, the entire responsibility and credit of law enforcement are left with the local police departments and the courts of the cities.

The following report from the director of law enforcement indicates something of the activities of this division, and of the quickened interest of the police departments of the cities and towns of the State in the laws for the prevention of the spread of venereal diseases:

Total number of investigations made	2,142
Total number of arrests made with the co-operation of local police departments throughout Virginia	1,926
Lectures given on law enforcement	56
Investigations made for other organizations	105
Signs destroyed advertising cures for venereal diseases	467
Physicians known to have violated law, reported but not prosecuted	14
Physicians prosecuted and convicted	1
Newspapers reported for advertising cures for venereal diseases but not prosecuted	1
Druggists reported but not prosecuted	57
Druggists prosecuted and convicted	2
Merchants handling venereal disease cures warned but not prosecuted	108

Commonwealth attorneys consulted in reference to enforcement of venereal disease laws 76

Sheriffs and jailors consulted in reference to enforcement of venereal disease laws 94

The following is a list of places in Virginia visited on complaint of citizens by the investigating officer. Arrests made by the various police departments on charges involving sexual immorality and coming within the provision of laws for the suppression of vice and the prevention of venereal diseases are placed opposite:

Ashland	0	Franklin	1	Martinsville	29
Boydton	0	Luray	0	Charlottesville	51
Richmond	590	Danville	132	Marion	39
West Point	1	Front Royal	0	Newport News	601
Petersburg	152	South Hill	0	Covington	0
Buena Vista	4	Fincastle	0	Richlands	0
Tappahannock	0	Rocky Mount	45	Cartersville	0
Harrisonburg	4	Lexington	2	Dunn Loring	0
Cumberland	2	Salem	22	Round Hill	0
Louisa	0	Winchester	2	Purcellville	0
Tunstall	0	Waynesboro	12	Alexandria	51
Farmville	7	Norfolk	729	Blackstone	2
Clifton Forge	9	Bedford	2	Appomattox	1
East Radford	3	Gloucester	1	Lynchburg	215
Irvington	0	Mathews	0	Roanoke	167
Centralia	0	Culpeper	0	Leesburg	0
Rectortown	0	Smithfield	0	Hopewell	96
Chatham	2	Bristol	64	Cape Charles	1
Christiansburg	1	Port Royal	0	Phoebus	18
Hampton	9	Berryville	2	Marshall	0
Suffolk	27	Big Stone Gap	21	Woodstock	2
Burkeville	0	Appalachia	4	Warrenton	0
Glasgow	0	Norton	6	South Boston	0
Ocean View	58	Emporia	5	Keysville	1
Basic City	5	Claremont	8	Victoria	2
Belona	0	Gate City	4	Clarksville	0
Staunton	37	Garrisonville	0	Tazewell	2
Williamsburg	2	Manassas	0	Colonial Beach	0
Lawrenceville	1				

In reference to the above named cities, I respectfully request that the police departments of Richmond, Norfolk, Farmville, Alexandria and Norton be cited for co-operation and efficiency, and the police authorities of Prince Edward, Wise, Spotsylvania and Cumberland counties have also given this department their unlimited co-operation. The police departments of Berryville, Va., Clark and Chesterfield counties have not shown a desire nor have they tried in any way to co-operate with this department even when undesirable conditions have been brought to the attention of law enforcement agencies in person and confirmed in writing by the director of law enforcement.

Pharmacists throughout Virginia are giving their co-operation. I respectfully request that the law in reference to the sale of patent medicines for the supposed-to-be cure of venereal disease be changed so that no person but a registered or an assistant registered pharmacist be allowed to sell venereal disease cures. Respectfully request that general merchants be prohibited from selling patent medicines for venereal diseases.

Physicians are not giving the best co-operation. Some conflict seems to exist in reference to physicians reporting persons infected with a venereal disease for fear that the names of the patients might be exposed.

I respectfully request that physicians be notified that name or number of patient is treated confidentially by the health department, and the law is only intended to force persons to take treatment from reputable physicians, and not attempt self-treatment or the use of patent medicines.

City boards of health are giving the utmost co-operation, especially Alexandria, Danville, Norfolk, Newport News, Roanoke, Lynchburg and Richmond. County boards of health are loath to take legal action against persons infected with and spreading venereal diseases. I respectfully request that the county boards of health be informed that it is their duty to see that such persons are given proper treatment.

Commonwealth attorneys are giving their co-operation in all parts of Virginia, especially in the cities of Richmond, Roanoke, Petersburg, Newport News, Danville and the counties of Chesterfield, Wise, Louisa, Highland, Prince Edward and Accomac.

Courts in Virginia are giving co-operation. Some few don't seem to understand that in trying persons guilty of immorality and suspected of being infected with a venereal disease, that these persons are sick and need medical attention and are not criminals.

The majority of hotels in Virginia are trying to prevent immorality being carried on in their places.

Automobiles seem to be the greatest hindrance to combating venereal diseases. I respectfully request that the law be changed to include the seizure of the automobile in addition to a fine and jail sentence, as a fine generally does not discourage, for it serves as a license to do business since nine times out of ten the jail sentence is suspended.

Every county in the State of Virginia has been visited once or twice with the exception of Dickenson, Buchanan, Grayson and Carroll, for either investigation of venereal diseases, or consulting the Commonwealth attorney, sheriff, court, health officers, druggists, physicians, or the police department.

PLACES VISITED DURING YEAR.

Augusta	2
Deerfield	1
Warm Springs	1
Hot Springs	1
Covington	1
Clifton Forge	1
Longdale	1
Lexington	2
Fairfield	1
Waynesboro	2
Charlottesville	3
Red Hill	1
Covesville	1
Lovingston	1
Amherst	1
Lynchburg	5
Bedford	2
Hollins	1
Roanoke	5
Troutville	1
Fincastle	1
Buchanan	1
Glasgow	1
Big Island	1
Farmville	7
Midlothian	5
Ashland	9
Williamsburg	4
Newport News	4
Norfolk	8
Portsmouth	8
Christiansburg	4
Petersburg	2
Waverly	2
Wakefield	2
Emporia	2
Franklin	1
Morrisville	1
Danville	3
Salem	2
Bristol	2
Radford	2
Norton	2
Big Stone Gap	2
Coeburn	2
Tazewell	2
Martinsville	1
Louisa	1
West Point	1
Bowling Green	1
Blacksburg	2
Max Meadows	1
Centralia	1
Cartersville	1
Belona	1
Barhamsville	1
Courtland	1
Dawn	1
Gloucester	1
Hartewood	1
Mathews	1
Tappahannock	1
Aldie	1
Newland	1
Heathsville	1
Irvington	1
Fairport	1
Claremont	1
Fairmont	1
Yorktown	1
Phoebus	1
Suffolk	2
Burkeville	3
South Boston	2
Buena Vista	1
Pembrook	1
Pearisburg	1
Marion	1
Abingdon	1
Gate City	1
Appalachia	2
Richlands	1
Clintwood	1
Jonesville	1
Pulaski	3
Houston	1
South Hill	1
Negro Foot	1
Mineral	1
Gordonsville	4
Orange	2
Culpeper	2
Fredericksburg	6

Places Visited During Year—CONTINUED.

Hampton	3
Cape Charles	1
Ocean View	3
Onancock	1
Quantico	5
Fairfax	1
Upperville	1
Milwood	1
Riverton	1
Front Royal	1
Flint Hill	1
Washington	1
Sperryville	1
Remington	1
Warrenton	1
Manassas	2
Herndon	1
Ashburn	1
Leesburg	2
Purcellville	1
Berryville	2
Winchester	2
Strasburg	1
Wilson	2
Rural Retreat	1
Tunstall	1
Falls Church	1
Rectortown	1
Acooquan	1
Woodstock	1
New Market	1
Luray	1
Stanley	1
Madison	1
Ruckersville	1
Standardsville	1
Lydia	1
Elkton	1
Harrisonburg	5
Staunton	7
Churchville	1
Monterey	1
Evergreen	1
Pamplin	2
Prospect	2
Sabot	1
State Farm	1
Ford	2
Montrose	1
Oak Grove	1
Colonial Beach	1
Stafford	1
Alexandria	9
Columbia	1
Fork Union	1
Bremo	1
Arvonia	1
Dillwyn	1
Curdsville	1
Shepard	1
Spout Spring	1
Concord	1
Rustburg	1
Gladys	1
Naruna	1
Brookneal	1
Phenix	1
Charlotte C. H.	1
Keysville	1
Victoria	2
Kenbridge	2
Church Road	1

Report of Clinical Service of Bureau of Social Hygiene

TABLE I.

Patients Treated According to Disease, Color and Sex, October 1, 1920, *to September* 30, 1921.

	Syphilis	Gonorrhea	Chancroid	White	Black	Male	Female
Alexandria	87	128	26	81	160	182	59
Bon Air (2 months)	14	....	....	14	....	....	14
Central State Hospital	212	....	....	....	212	116	96
Danville	100	124	5	103	126	150	79
Ivakota Farm	22	33	3	58	....	....	58
Lynchburg	77	166	27	130	140	166	104
Norton	321	217	1	486	53	445	94
Norfolk	558	231	48	407	430	487	350
Newport News	500	260	3	188	575	474	289
Penitentiary	170	....	....	14	156	167	3
Piedmont Sanatorium	14	....	....	....	14	7	7
Petersburg	152	273	10	149	286	246	189
Richmond	843	223	1	169	898	655	412
Roanoke	130	183	32	244	101	294	51
University of Virginia (7 months)	137	104	4	141	104	154	91
Total	3,337	1,942	160	2,184	3,255	3,543	1,896
Reported by physicians	358	1,310	90	1,147	611	1,549	209
Total	3,695	3,252	250	3,331	3,866	5,092	2,105

TABLE II.

Patients Treated According to Ages, October 1, 1920, to September 30, 1921.

CLINICS	Under 10	10-19	20-29	30-39	40-49	Over 50	Total
Alexandria	3	59	114	36	18	11	241
Bon Air (2 months)	....	14	....	....	....	....	14
Central State Hospital	....	4	26	72	68	42	212
Danville	5	33	151	38	2	....	229
Ivakota Farm	1	38	15	2	2	....	58
Lynchburg	8	80	123	41	13	5	270
Norton	2	92	287	99	47	12	539
Norfolk	2	143	450	161	66	15	837
Newport News	2	127	495	100	30	9	763
State Penitentiary	....	18	131	14	7	....	170
Piedmont Sanatorium (3 months)	....	1	6	4	3	....	14
Petersburg	3	100	233	73	17	9	435
Richmond	23	204	579	158	75	28	1,067
Roanoke	....	86	204	43	9	3	345
University of Virginia (7 months)	10	57	82	54	29	13	245
Total	59	1,056	2,896	895	386	147	5,439
Reported by physicians	13	245	1,055	309	99	37	1,758
Total	72	1,301	3,951	1,204	485	184	7,197

TABLE III.

Summary of New Cases, Visits to Clinics, Cases Treated and Arsphenamine October 1, 1920, to September 30, 1921.

CLINICS	New Cases	Cases Under Treatment	Visits to Clinics	Doses of Arsphenamine
Alexandria	241	613	3,800	910
Bon Air (2 months)	14	14	....	....
Central State Hospital	212	680	....	....
Danville	229	488	1,036	322
Ivakota Farm	58	369	3,736	374
Lynchburg	270	3,227	4,777	623
Norton	539	3,873	6,480	1,681
Norfolk	837	2,152	7,790	2,342
Newport News	763	3,840	6,617	3,571
State Penitentiary	170	529	....	....
Piedmont Sanatorium (3 months)	14	14	....	....
Petersburg	435	2,156	4,839	1,113
Richmond	1,067	7,439	13,725	4,800
Roanoke	345	1,229	4,824	728
University of Virginia	245	1,016	1,972	1,162
Total	5,439	26,812	59,596	17,626

TABLE IV.

Institutional Wassermann Report.

	Pos.	Neg.	Unsat.	Total	Per Cent. Pos.*
Western State	40	594	12	646	6.3
Eastern State	39	152	2	193	20.4
Central State	104	374	2	480	21.8
Southwestern State	30	744	3	777	3.9
Epileptic Colony	89	383	4	476	18.9
State Penitentiary and State Farm	297	790	8	1,095	27.3
Laurel Industrial School	1	157	....	158	0.6
Colored Reform School (Hanover)	24	173	1	198	12.2
Industrial School (Bon Air)	29	106	2	137	21.5
Industrial School (Peake)	26	54	....	80	32,5
Total	679	3,527	34	4,240	16.0

*Based on total number of positive and negative tests.

Report of State Inspector of Hotels and Convict Camps

October 1, 1920—*September* 30, 1921.

Inspection of hotels in Virginia this year showed some improvement in most cases, but there are a few scattered throughout the State that it is practically impossible to improve under the present law and system of inspection, therefore, I respectfully submit the following recommendations:

1. That at least one more inspector be put on so that more frequent inspections can be made. I have had very good results from an unexpected reinspection of several of the smaller hotels.

2. It is again recommended that it be unnecessary for the inspector to give the proprietor, or managers, a written notice of his failure to comply with the law thereby making the proprietor, or managers, liable to prosecution at any time the inspector finds the law is not being complied with. Under the present system of one inspection and at that time having to give the proprietor, or manager, notice that he must do certain things in a stated time, all parties knowing that it is practically impossible for the inspector to return at the end of the stated time, weakens the entire inspection law and tends to make the managers careless or indifferent in complying with the inspector's instructions.

3. That the present system of the inspector having to collect a fee for the inspection of hotels be done away with. This very often is a handicap to the inspector in that some proprietors take the stand that it is unjust to be forced to have their places inspected and then have to pay for the inspection.

4. That the present law be changed to read, "A hotel is defined by law as a public lodging house of more than five bedrooms, which accommodates transient guests." This change would make it necessary for more inspectors as the number of hotels would be increased about fifty per cent.

Following is a table of hotels inspected and their rating according to our scoring system:

Total number of hotels inspected	272
Number of hotels receiving gilt certificates	114
Number of hotels receiving gilt certificates on letter from proprietor	34
Number of hotels receiving gilt certificates on inspection	80
Number of hotels receiving silver certificates	28
Number of hotels receiving silver certificates on letter from proprietor	26
Number of hotels certified at inspection	2
Number of hotels receiving red certificate	5
Number of hotels receiving plain certificate	1
Total number of hotels certified	148

TABLE SHOWING INSPECTION OF HOTELS FOR 1920-21.

PLACE	HOTEL	INSPECTED BY	Fee Charged	Paid	Rating
Abingdon	Abingdon	G. M. Gilkeson	$ 8.00	Yes	Gilt*
Afton	Afton	G. M. Gilkeson	5.50	Yes	Silver*
Altavista	Commonwealth	G. M. Gilkeson	10 00	Yes	Gilt*
Alberta	Alberta	G. M. Gilkeson	3 00	Yes	Silver*
Alexandria	Monticello	G. M. Gilkeson	5 75	Yes	Gilt*
Ashland	Henry Clay Inn	G. M. Gilkeson	4 50	Yes	Gilt
Alleghany Springs	Alleghany Springs	G. M. Gilkeson	8 00	Yes	
Alexandria	Rammel	G. M. Gilkeson	6 00	Yes	Silver
Appomattcx	New Appomattox	G. M. Gilkeson	5 00	Yes	Gilt
Abingdon	Hawthorne's Boarding House	G. M. Gilkeson	4 00	Yes	
Accomac	Doughty	G. M. Gilkeson	4 50	Yes	
Appalachia	Houston	G. M. Gilkeson	5 00	Yes	
Bristol	Tip Top	G. M. Gilkeson	7 75	Yes	Red*
Bristol	Bristol	G. M. Gilkeson	10 00	Yes	Gilt*
Bristol	St. Lawrence	G. M. Gilkeson	7 25	Yes	Gilt*
Bristol	Virginia	G. M. Gilkeson	10 00	Yes	
Bedford	Palace	G. M. Gilkeson	5 75	Yes	Gilt*
Bedford	Mons	G. M. Gilkeson	8 75	Yes	Gilt
Buchanan	Botetourt	G. M. Gilkeson	4 50	Yes	Gilt*
Blue Ridge Springs	Blue Ridge Springs	G. M. Gilkeson	10 00	Yes	
Bowling Green	Lawn	G. M. Gilkeson	5 00	Yes	Plain*
Blackstone	Blackstone	G. M. Gilkeson	3 50	Yes	
Buckroe Beach	Virginia	G. M. Gilkeson	7 25	Yes	Gilt
Buckroe Beach	Buckroe Beach	G. M. Gilkeson	10 00	Yes	Gilt*
Burkeville	Burkeville	G. M. Gilkeson	3 50	Yes	Gilt
Buena Vista	Marlbrook	G. M. Gilkeson	5 25	Yes	Gilt
Buena Vista	Jefferson	G. M. Gilkeson	4 00	Yes	
Blacksburg	Blacksburg Inn	G. M. Gilkeson	4 00	Yes	Gilt
Berryville	Battle Town Inn	G. M. Gilkeson	7 00	Yes	Gilt
Basic City	Belmont	G. M. Gilkeson	4 50	Yes	
Big Stone Gap	Monte Vista	G. M. Gilkeson	10 00	Yes	Gilt*
Buffalo Lithia	Buffalo Lithia Springs	G. M. Gilkeson	10 00	Yes	
Colonial Beach	Byrd	G. M. Gilkeson	5 50	Yes	
Colonial Beach	Mench	G. M. Gilkeson	5 00	Yes	
Colonial Beach	De Attley	G. M. Gilkeson	3 .50	Yes	
Colonial Beach	Linwood	G. M. Gilkeson	10 00	Yes	
Colonial Beach	Rollins	G. M. Gilkeson	3 75	Yes	Gilt
Colonial Beach	Colonial Beach	G. M. Gilkeson	10 00	Yes	
Colonial Beach	New Atlanta	G. M. Gilkeson	6 00	Yes	Gilt
Colonial Beach	Wolcott	G. M. Gilkeson	10 00	Yes	Gilt
Colonial Beach	King George	G. M. Gilkeson	5 50	Yes	
Charlottesville	Queen Charlotte	G. M. Gilkeson	10 00	Yes	Gilt*
Charlottesville	Claremont	G. M. Gilkeson	7 50	Yes	Silver*
Charlottesville	Gleason	G. M. Gilkeson	10 00	Yes	Gilt
Charlottesville	Colonial	G. M. Gilkeson	10 00	Yes	Gilt
Clarksville	Grace	G. M. Gilkeson	6 00	Yes	
Cape Charles	Virginia	G. M. Gilkeson	4 25	Yes	
Cape Charles	Arlington	G. M. Gilkeson	7 50	Yes	
Crewe	Oliver	G. M. Gilkeson	4 50	Yes	
Craig Healing	Craig Healing Springs	G. M. Gilkeson	10 00	Yes	Gilt
Clifton Forge	Gladys Inn	G. M. Gilkeson	10 00	Yes	Gilt*
Covington	O'Gara	G. M. Gilkeson	7 00	Yes	Gilt*
Covington	Collins	G. M. Gilkeson	10 00	Yes	Gilt*
Crockett Springs	Crockett Springs	G. M. Gilkeson	10 00	Yes	Red*
Chatham	New Bennett	G. M. Gilkeson	6 50	Yes	Gilt*
Culpeper	Waverly	G. M. Gilkeson	8 76	Yes	Silver*
Wytheville	Fourth Avenue	G. M. Gilkeson	10 00	Yes	Silver*
Chase City	Gregory	G. M. Gilkeson	7 50	Yes	Silver*
Danville	Pittsylvania	G. M. Gilkeson	10 00	Yes	
Danville	Burton	G. M. Gilkeson	10 00	Yes	Gilt
Danville	Leeland	G. M. Gilkeson	10 00	Yes	Gilt
Danville	Virginia	G. M. Gilkeson	6 25	Yes	
Dante	Clinchfield Inn	G. M. Gilkeson	10 00	Yes	Gilt*
Emporia	Virginia	G. M. Gilkeson	9 75	Yes	Gilt*
Elkton	Virginia	G. M. Gilkeson	5 00	Yes	Silver*
Edinburg	Edinburg	G. M. Gilkeson	5 00	Yes	
Elkton	Elkton	G. M. Gilkeson	10 00	Yes	Gilt
Elkton	Virginia	G. M. Gilkeson	4 50	Yes	
Front Royal	Strickler	G. M. Gilkeson	5 25	Yes	
Front Royal	Afton Inn	G. M. Gilkeson	8 00	Yes	Gilt
Franklin	Stonewall Inn	G. M. Gilkeson	10 00	Yes	
Farmville	Continental	G. M. Gilkeson	3 00	Yes	
Farmville	Prince Edward	G. M. Gilkeson	5 00	Yes	
Fredericksburg	Princess Anne	G. M. Gilkeson	10 00	Yes	Gilt*

---

*Indicates hotels certified on letter from proprietor, not from re-inspection.

Table Showing Inspection of Hotels for 1920-21—Continued.

PLACE	HOTEL	INSPECTED BY	Fee Charged	Paid	Rating
Fredericksburg	Maury	G. M. Gilkeson	$ 7 75	Yes	Silver*
Fredericksburg	Athens	G. M. Gilkeson	8 25	Yes	Silver*
Fredericksburg	Tinders	G. M. Gilkeson	4 50	Yes	Gilt*
Gate City	Gate City	G. M. Gilkeson	5 00	Yes	Silver*
Greenwood	Greenwood	G. M. Gilkeson	5 50	Yes	
Gordonsville	St. John	G. M. Gilkeson	5 00	Yes	Gilt
Gordonsville	Exchange	G. M. Gilkeson	3 50	Yes	
Gretna	Virginia	G. M. Gilkeson	5 50	Yes	Gilt*
Glade Springs	Glade	G. M. Gilkeson	5 75	Yes	
Halifax	Halifax Inn	G. M. Gilkeson	4 50	Yes	Silver*
Healing Springs	Healing Springs	G. M. Gilkeson	10 00	Yes	Gilt*
Hot Springs	Homestead	G. M. Gilkeson	10 00	Yes	Gilt*
Hopewell	Du Pont	G. M. Gilkeson	10 00	Yes	
Hampton	New Virginia	G. M. Gilkeson	4 00	Yes	
Hampton	Langley	G. M. Gilkeson	10 00	Yes	
Harrisonburg	Hilbert	G. M. Gilkeson	6 50	Yes	
Harrisonburg	The Warren	G. M. Gilkeson	3 50	Yes	Gilt
Harrisonburg	National	G. M. Gilkeson	8 00	Yes	Gilt
Harrisonburg	Kavanaugh	G. M. Gilkeson	10 00	Yes	Gilt
Harrisonburg	Valley House	G. M. Gilkeson	3 00	Yes	
Harrisonburg	Virginia House	G. M. Gilkeson	2 75	Yes	
Irvington	Irvington Beach	G. M. Gilkeson	6 00	Yes	Gilt
Kilmarnock	Eubank	G. M. Gilkeson	4 75	Yes	Gilt*
Keysville	Charlotte	G. M. Gilkeson	4 50	Yes	
Lynchburg	Carroll	G. M. Gilkeson	10 00	Yes	Gilt
Lynchburg	Lamont	G. M. Gilkeson	5 75	Yes	
Lynchburg	Virginia	G. M. Gilkeson	10 00	Yes	Gilt*
Lexington	Lexington	G. M. Gilkeson	10 00	Yes	Gilt*
Lexington	Central	G. M. Gilkeson	4 00	Yes	Gilt
Lexington	Sheridans	G. M. Gilkeson	5 00	Yes	Silver*
Lawrenceville	Central	G. M. Gilkeson	4 50	Yes	
Leesburg	Leesburg Inn	G. M. Gilkeson	10 00	Yes	
Louisa	Louisa	G. M. Gilkeson	5 75	Yes	
Luray	Mansion Inn	G. M. Gilkeson	10 00	Yes	
Luray	Commercial	G. M. Gilkeson	4 25	Yes	
Luray	Lawrence	G. M. Gilkeson	6 75	Yes	Gilt
Manassas	Prince William	G. M. Gilkeson	6 00	Yes	
Martinsville	Hamilton	G. M. Gilkeson	5 25	Yes	
Mountain Lake	Mountain Lake	G. M. Gilkeson	10 00	Yes	Gilt
Middletown	Wayside Inn	G. M. Gilkeson	7 50	Yes	Gilt
Marion	Marion	G. M. Gilkeson	10 00	Yes	Gilt
Mount Eliot	Mt. Eliot	G. M. Gilkeson	10 00	Yes	Gilt
Mt. Jackson	Mt. Jackson	G. M. Gilkeson	4 00	Yes	Gilt*
Newport News	New York	G. M. Gilkeson	10 00	Yes	
Newport News	Palace	G. M. Gilkeson	5 00	Yes	
Newport News	Royal Rooms	G. M. Gilkeson	7 00	Yes	
Newport News	Grafton	G. M. Gilkeson	10 00	Yes	Gilt
Newport News	Lexington	G. M. Gilkeson	4 50	Yes	
Newport News	Warwick	G. M. Gilkeson	10 00	Yes	Gilt
Newport News	Virginia	G. M. Gilkeson	10 00	Yes	
Newport News	Newport	G. M. Gilkeson	10 00	Yes	
Newport News	Washington Square	G. M. Gilkeson	7 00	Yes	
Newport News	Strand	G. M. Gilkeson	10 00	Yes	Silver*
Newport News	Commercial	G. M. Gilkeson	3 75	Yes	Silver*
Norfolk	Cozy Inn	G. M. Gilkeson	3 75	Yes	Silver*
Norfolk	City	G. M. Gilkeson	5 00	Yes	Silver*
Norfolk	Royal	G. M. Gilkeson	4 00	Yes	Silver*
Norfolk	National	G. M. Gilkeson	10 00	Yes	Red*
Norfolk	Edward	G. M. Gilkeson	10 00	Yes	Silver*
Norfolk	Gordons	G. M. Gilkeson	9 25	Yes	Gilt*
Norfolk	Stroud	G. M. Gilkeson	5 00	Yes	Gilt*
Norfolk	Neddo	G. M. Gilkeson	10 00	Yes	Gilt
Norfolk	Norfolk	G. M. Gilkeson	10 00	Yes	Gilt
Norfolk	Mitchells	G. M. Gilkeson	4 00	Yes	
Norfolk	Southland	G. M. Gilkeson	10 00	Yes	Gilt
Norfolk	Atlantic	G. M. Gilkeson	10 00	Yes	Gilt
Norfolk	Gordons	G. M. Gilkeson	3 50	Yes	
Norfolk	Victoria	G. M. Gilkeson	10 00	Yes	Gilt
Norfolk	Ballentines	G. M. Gilkeson	7 50	Yes	
Norfolk	London	G. M. Gilkeson	3 00	Yes	
Norfolk	A No. 1 Hotel and Cafe	G. M. Gilkeson	4 00	Yes	
Norfolk	Monticello	G. M. Gilkeson	10 00	Yes	Gilt
Norfolk	Fairfax	G. M. Gilkeson	10 00	Yes	Gilt
Norfolk	Grand	G. M. Gilkeson	6 00	Yes	Silver*
Norfolk	Montana	G. M. Gilkeson	9 00	Yes	

---

*Indicates hotels certified on letter from proprietor, not from re-inspection.

Table Showing Inspection of Hotels for 1920-21—Continued.

PLACE	HOTEL	INSPECTED BY	Fee Charged	Paid	Rating
Norfolk	Lorraine	G. M. Gilkeson	$ 10 00	Yes	Gilt
Norfolk	Dodson	G. M. Gilkeson	3 25	Yes	
Norfolk	Alsace	G. M. Gilkeson	10 00	Yes	
Norfolk	Granby Inn	G. M. Gilkeson	10 00	Yes	
Norfolk	American	G. M. Gilkeson	3 75	Yes	
Norfolk	Commercial	G. M. Gilkeson	8 50	Yes	
Natural Bridge	Natural Bridge	G. M. Gilkeson	10 00	Yes	Gilt
Nimrod Hall	Nimrod Hall	G. M. Gilkeson	9 00	Yes	Gil
Norton	New St. Charles	G. M. Gilkeson	10 00	Yes	
Norton	Mountain View	G. M. Gilkeson	4 00	Yes	
Orkney Springs	Orkney Springs	G. M. Gilkeson	10 00	Yes	
Orange	Coleman	G. M. Gilkeson	6 50	Yes	Gilt*
Onancock	Onancock	G. M. Gilkeson	4 00	Yes	
Ocean View	Virginia	G. M. Gilkeson	3 75	Yes	
Ocean View	Cason	G. M. Gilkeson	6 25	Yes	Gilt
Ocean View	Ruth	G. M. Gilkeson	6 75	Yes	Gilt
Ocean View	Red Gate	G. M. Gilkeson	6 75	Yes	
Ocean View	Water View	G. M. Gilkeson	2 75	Yes	Gilt
Ocean View	Breakers	G. M. Gilkeson	4 75	Yes	Gilt
Ocean View	Atlantic	G. M. Gilkeson	9 00	Yes	Gilt
Ocean View	Lowe	G. M. Gilkeson	7 50	Yes	Gilt
Ocean View	Georgia	G. M. Gilkeson	5 75	Yes	
Ocean View	Diggs	G. M. Gilkeson	10 00	Yes	Gilt
Ocean View	Roanoke	G. M Gilkeson	5 50	Yes	Gilt
Ocean View	Pacific	G. M. Gilkeson	4 00	Yes	
Ocean View	Atlantic	G. M. Gilkeson	4 00	Yes	
Ocean View	Jefferson	G. M. Gilkeson	5 00	Yes	
Ocean View	Virginia Bay	G. M. Gilkeson	10 00	Yes	Gilt
Ocean View	Rustic	G. M. Gilkeson	6 00	Yes	Gilt
Ocean View	Richmond	G. M. Gilkeson	4 25	Yes	Silver*
Ocean View	Newport	E. M. Gilkeson	3 00	Yes	Gilt
Ocean View	Ocean View	G. M. Gilkeson	10 00	Yes	Gilt
Petersburg	Chesterfield	G. M. Gilkeson	7 50	Yes	
Petersburg	Commercial	G. M. Gilkeson	4 75	Yes	
Petersburg	Petersburg	G. M. Gilkeson	10 00	Yes	
Petersburg	Virginia	G. M. Gilkeson	3 00	Yes	
Petersburg	Crystal	G. M. Gilkeson	3 25	Yes	
Petersburg	Savoy	G. M. Gilkeson	8 75	Yes	
Petersburg	Jefferson	G. M. Gilkeson	10 00	Yes	Gilt
Petersburg	France	G. M. Gilkeson	4 25	Yes	
Petersburg	Stratford	G. M. Gilkeson	10 00	Yes	
Petersburg	Exchange	G. M. Gilkeson	10 00	Yes	Gilt
Portsmouth	Monroe	G. M. Gilkeson	10 00	Yes	
Portsmouth	Hughes	G. M. Gilkeson	3 00	Yes	
Portsmouth	Lewis	G. M. Gilkeson	10 00	Yes	Gilt*
Phoebus	American	G. M. Gilkeson	3 25	Yes	
Pulaski	Pulaski	G. M. Gilkeson	10 00	Yes	
Pulaski	Maple Shade Inn	G. M. Gilkeson	10 00	Yes	Gilt*
Pulaski	American	G. M. Gilkeson	4 25	Yes	
Pearisburg	Savoy	G. M. Gilkeson	4 50	Yes	
Pennington Gap	Pennington	G. M. Gilkeson	6 00	Yes	
Roanoke	Ponce de Leon	G. M. Gilkeson	10 00	Yes	Gilt*
Roanoke	Roanoke	G. M. Gilkeson	10 00	Yes	Gilt
Roanoke	Shenandoah	G. M. Gilkeson	10 00	Yes	Gilt
Roanoke	Powhatan	G. M. Gilkeson	10 00	Yes	
Roanoke	Cox	G. M. Gilkeson	4 00	Yes	
Roanoke	Randolph	G. M. Gilkeson	6 25	Yes	
Roanoke	Travelers	G. M. Gilkeson	5 00	Yes	Silver*
Roanoke	Dixie	G. M. Gilkeson	5 50	Yes	Silver*
Roanoke	Virginia	G. M. Gilkeson	5 50	Yes	
Roanoke	Raleigh	G. M. Gilkeson	7 00	Yes	Gilt
Richmond	Rueger	G. M. Gilkeson	10 00	Yes	Gilt
Richmond	Richmond	G. M. Gilkeson	10 00	Yes	Gilt
Richmond	Sharlee	G. M. Gilkeson	5 75	Yes	
Richmond	Murphys	G. M. Gilkeson	10 00	Yes	Gilt
Richmond	Franklin	G. M. Gilkeson	9 00	Yes	
Richmond	Stumpf	G. M. Gilkeson	10 00	Yes	
Richmond	Gilbert	G. M. Gilkeson	7 50	Yes	Gilt
Richmond	Cornell & Miller	G. M. Gilkeson	6 00	Yes	Gilt
Richmond	Lexington	G. M. Gilkeson	10 00	Yes	
Richmond	New Commercial	G. M. Gilkeson	3 50	Yes	
Rocky Mount	Rocky Mount	G. M. Gilkeson	7 75	Yes	Gilt
Radford	Grand	B. M. Gilkeson	6 00	Yes	
Radford	Bonham	G. M. Gilkeson	10 00	Yes	
Remlik	Remlik	G. M. Gilkeson	10 00	Yes	Silver*
Ripley Springs	Virginia Mineral Springs	G. M. Gilkeson	10 00	Yes	Gilt

---

*Indicates hotels certified on letter from proprietor, not from re-inspection.

Table Showing Inspection of Hotels for 1920-21—*Continued.*

PLACE	HOTEL	INSPECTED BY	Fee Charged	Paid	Rating
Staunton	Beverly	G. M. Gilkeson	$ 10 00	Yes	
Staunton	Virginia	G. M. Gilkeson	10 00	Yes	Gilt
Staunton	Augusta	G. M. Gilkeson	10 00	Yes	
Strasburg	Machir	G. M. Gilkeson	8 00	Yes	Gilt
Shenandoah	Eagle	G. M. Gilkeson	6 00	Yes	Silver*
South Boston	Garland	G. M. Gilkeson	10 00	Yes	
Skyland	Stoneman Camp	R. K. Flannagan	10 00	Yes	
Suffolk	Nansemond	G. M. Gilkeson	10 00	Yes	Silver*
Suffolk	B. B	G. M. Gilkeson	4 50	Yes	
South Hill	Nordan	G. M. Gilkeson	8 75	Yes	
Salem	Salem	G. M. Gilkeson	10 00	Yes	Red*
St. Paul	Blue Suplhur	G. M. Gilkeson	10 00	Yes	Red*
Tazewell	Tazewell	G. M. Gilkeson	5 00	Yes	
Urbanna	Ross	G. M. Gilkeson	4 00	Yes	Silver*
Virginia Beach	Spottswood Arms	G. M. Gilkeson	7 50	Yes	Gilt
Virginia Beach	Waverly	G. M. Gilkeson	9 00	Yes	Gilt
Virginia Beach	Kennilworth	G. M. Gilkeson	7 75	Yes	Gilt
Virginia Beach	Firzhugh	G. M. Gilkeson	5 00	Yes	Gilt
Virginia Beach	Driftwood	G. M. Gilkeson	5 00	Yes	Gilt
Virginia Beach	Courtney Terrace	G. M. Gilkeson	7 50	Yes	Gilt
Virginia Beach	Pocahontas	G. M. Gilkeson	8 75	Yes	Gilt
Virginia Beach	Arlington	G. M. Gilkeson	10 00	Yes	
Virginia Beach	Greenwood	G. M. Gilkeson	4 75	Yes	Gilt
Virginia Beach	Albemarle Hall	G. M. Gilkeson	9 00	Yes	Silver*
Warrenton	Warren Green	G. M. Gilkeson	8 00	Yes	Gilt
Waynesboro	Neese	G. M. Gilkeson	6 25	Yes	Gilt*
Waynesboro	Wayne Inn	G. M. Gilkeson	4 50	Yes	Gilt*
Waynesboro	Brunswick Inn	G. M. Gilkeson	10 00	Yes	Gilt
Woodstock	Holtzman	G. M. Gilkeson	10 00	Yes	
Warm Springs	Warm Suplhur Springs	G. M. Gilkeson	10 00	Yes	
Winchester	City	G. M. Gilkeson	4 50	Yes	
Winchester	Fairfax	G. M. Gilkeson	5 25	Yes	
Wincheeter	Evans	G. M. Gilkeson	10 00	Yes	Gilt
Winchester	Jack	G. M. Gilkeson	10 00	Yes	Gilt
Williamsburg	Colonial Inn	G. M. Gilkeson	4 75	Yes	Red*
Wachapreague	Wachapreague	G. M. Gilkeson	10 00	Yes	
Yorktown	Yorktown	G. M. Gilkeson	10 00	Yes	Gilt*
Yellow Sulphur	Yellow Sulphur	G. M. Gilkeson	10 00	Yes	

*Indicates hotels certified on letter from proprietor, not from re-inspection.

CONVICT CAMPS.

With few exceptions there has been very little improvement in the camps throughout the State this year.

Attached is a table showing the comparative scores of the camps inspected. As in 1920 very few camp superintendents have on file records of vaccination against smallpox, or typhoid. No camp has the above records for jail prisoners.

At two camps I found that at times they had been overcrowded, one camp having a capacity of sixty-seven men had at one time eighty-five men. At that time there were twelve more men than mattresses.

At another camp twelve jail prisoners were sent in and were there for more than two weeks without a change of clothing, this after the sergeant in charge had notified prison authorities that there was no clothing on hand for new prisoners.

At no time has the State Board of Health been notified when there was a camp to be moved. This resulted in one camp being placed in a very bad location, no protection given the spring from which drinking water was obtained, and instead of privies the men were allowed to use the hillside just above the spring.

Jail prisoners, with as little as fifteen days' term, are being sent to the camps. This causes no little trouble to the camp superintendents and expense to the State, and at the same time these jail prisoners are liable to carry into the camps contagious diseases, as very few of them have been examined and vaccinated. At the lime-grinding plant at Irvington, Va., there are no sheets or pillow cases furnished. Several camps are short on cups for the men when at work. One camp had none at all. Guards are not careful to see that each man uses the cup given him. In view of the above, I respectfully recommend the following:

1. That all sergeants in charge of camps be instructed by the prison and road authorities in the essential points of locating a camp and taking the necessary sanitary precautions in the following order:

(1) Location water supply.

(2) Having water examined by the State Board of Health.

(3) Protect water supply.

(4) Locate camp below water supply if possible, or so drainage from camp and privies does not reach water supply.

(5) Erect proper privies.

(6) Build camp.

2. That no jail prisoners of less than thirty days' term be sent to State road camps and longer term prisoners only after a physical examination and after having been vaccinated against smallpox and typhoid fever.

3. That a standard plan of construction of buildings be adhered to, this to include cell, dining-room, storeroom and privies. R. H. Blevins, Camp No. 10, has constructed an excellent privy which is flyproof and not bulky to move. It is again recommended that the bunk platform for sleeping be done away with and individual beds or cots substituted.

Class	Camp No.	Sergeant	Address	P. C.	Reasons for Deductions from Score
1	21	J. H. Higginbotham	Culpeper....	97	Platform beds unsatisfactory.
1	2	W. H. Wade.........	Roanoke, R 1	96	Platform beds, no cups.
2	18	H. L. Higginbotham	Fairfax......	95	No records of vaccination.
2	12	Van Snellings.......	Salem.......	94	Platform beds no race separation, no showers, no reading facilities.
2	8	J. T. Ackerly........	Orange......	94	Platform beds, condition of storage house, no showers, poor privies.
2	L. G. No. 2	J. W. Woodland.....	Irvington...	93	Platform beds, no sheets, no pillow cases, no cups, few religious services
2	24	C. P. Smith.........	Longsdale...	92	Platform beds, no garden, no showers, no reading facilities, no services.
2	32	T. S Reames........	Blacksburg .	92	Platform beds, no race separation, no garden, no showers.
2	19	S. A. Patteson.......	Tazewell....	92	Platform beds, no separation, poor privies, lost time excessive, cell roof bad condition.
2	5	W. W. Higginbotham	Blackford...	91	No race separation, no vaccination records, no reading facilities, few services.
2	L. G. No. 2	W. F. Smith......... (Jan. 1921)	Staunton....	90.5	Platform beds, poor location, poor privies, no vaccination records, no reading, few services.
New Constrcution Since Inspection					
3	22	C. H. Jackson.......	Winchester..	90	Platform beds, no night clothes, no garden, no vaccination records.
3	20	G. W. Earman......	Buchanan...	89.5	Platform beds, insanitary kitchen, no garden, no vaccination records.
3	28	F. B. Bishop........	Boston......	89.5	Platform beds, poor ventilation, open spring, no showers, poor disposal pit.
3	10	R. H. Blevins.......	Randolph...	89	Platform beds, bad screens, no vaccination records, no reading facilities, few serivces.
3	1	W. T. Reams........	Abingdon...	88.5	Platform beds, no race separation, dirty kitchen, no garden, no vaccination records.
3	29	J. W. Johnson.......	Front Royal	87.5	Platform beds, poor buildings, no garden, no showers, open well, no vaccination records.
3	30	E. B. Anderson.....	Afton.......	86	Platform beds, poor buildings, poor screens, many flies, open spring, no showers, no reading matter, no services.
4	11	N. B. T. Coleman...	The Plains..	82	Platform beds, poor sleeping quarters, dirty mattresses, dirty dining tables, untidy grounds, bad water supply, no showers, bad privies, no vaccination records, no services.
4	4	G. F. Bing..........	Amherst....	79	Platform beds, bad location, bad dining room, bad kitchen, many flies, no screens, untidy grounds, poor water supply, no showers, poor privies, no vaccination records, overcrowded.

Sanitary Engineering Division

RICHARD MESSER, *Chief Engineer.*

Report for Year Ending September 30, 1921.

The personnel for the fiscal year has been as follows: Richard Messer, A. Wagner and L. H. Enslow, engineers; Miss Agnes Gilman, secretary, and Miss Ursula Thorne, filing and recording clerk.

The most important function of this division is to exercise a close supervision over the public water supplies in cities, towns, public and private institutions, and industrial communities; also to certify with regard to the purity of all water placed on railway coaches for drinking purposes.

Fortunately, there is a law on the statute books which requires any municipality, private corporation, or individual to submit plans or specifications for any new water works system or for material changes in the source or purification of an existing supply, to the State Board for approval, before construction of the work has been started. In approving such plans and specifications, the board assumes the responsibility that the designs are in accordance with the best engineering practice and that the supply will be safe and satisfactory, provided, of course, the proper care is given to the operation. At the present time, the board is not required by law to approve plans for sewerage systems or sewage plants. However, in the majority of cases where such work has been under consideration, the local authorities have requested advice as to the proper disposal of the sewage, and have submitted the final plans for approval.

Only a few of the small cities and a number of towns and institutions have found it necessary to construct expensive plants for the treatment of sewage. In the eastern part of the State there are four large rivers which empty into Chesapeake Bay, and all of these reach tidewater level about seventy miles from the coast. Consequently, these streams may receive large quantities of sewage without any public water supply being affected nor any nuisances resulting. The few large cities in other parts of the State are situated on large streams and disposal by dilution is all that is necessary at this time. As the population of the State increases the question of stream pollution will require careful consideration and the adoption of a policy for each stream, appertaining to the amount of sewage that will be discharged into it and the degree of treatment to be provided for is not far distant.

The municipal sewage plants now in operation are at Winchester, Harrisonburg, Manassas, Hot Springs, Chase City, Colonial Beach and Hopewell. Special investigations in connection with these are described in the body of the report; also an investigation of the Roanoke river, between Salem and Roanoke, from which the city expects to take additional water in the near future.

During the fiscal year there has not been a single epidemic of typhoid fever attributable to a public water supply. In view of the fact that approximately 700,000 people, equal to one-third of the entire population of the State, use water from public supplies, this is an unusually good record. The record is due in part to the close supervision over all supplies by personal visits to the plants, sanitary surveys of the sources, and by bacteriological examination of samples forwarded to the laboratory at regular intervals.

FILTER PLANT OPERATION.

Gradually the operation of several filter plants is being placed on a more scientific basis. To accomplish this requires numerous visits to the plants so as to become better acquainted with the operators and have intimate knowledge of the details of the plant. As a result, the superintendents and operators have taken more interest and are willing to accept constructive criticism and suggestions either with regard to the operating methods or in the need of additional equipment. In the case of the smaller plants, the operators are gradually being instructed how to make the more simple laboratory tests.

In several instances this division has assisted local authorities in securing competent operators and plant superintendents, and in several emergencies have sent a representative from the office to assist in the operation and to find out the trouble.

Monthly reports of operation are sent to this office, where they are carefully studied to learn whether the operation has been normal, abnormal or inefficient. Samples for bacterial examinations are sent in every two weeks for the purpose of checking up filtration results, and the official in charge is notified promptly of the results of each examination. The division is making a practice of furnishing to the smaller plants necessary reagents and apparatus for making free chlorine tests. Results obtained from the above policies of co-operation have been extremely gratifying on the whole, as evidenced by the consistently good reports on the samples.

Finally, it should be mentioned that in addition to filter plant supervision, including constructive criticism and expert advice, there is always a "trouble man" available to proceed to any plant having difficulties.

LABORATORY CONTROL OF WATER SUPPLIES.

During the past year a scheme of systematic collection of water samples from practically all of the public water supplies has been perfected. The schedule calls for bacterial examination of each supply at definite dates during the year. A card index system is used and each week a definite number of sample bottles are mailed to health officers, nurses, sanitary demonstrators, physicians, or other responsible individuals, for the purpose of collecting the samples. The schedule is so arranged that depending upon the nature of the supply and how safe it is considered, samples are collected semi-monthly, monthly, quarterly or semi-annually. The collection dates are distributed in such a manner as to give the laboratory as nearly a uniform load as possible. The results have been extremely gratifying and beneficial to all concerned. The office records now are more complete than would have been possible under the former method of collecting the samples.

In cases of private springs or wells, the division has been in a position to advise the owner whether the results are probably due to the entrance of surface or seepage water, and many replies have been received that such was the case and that the trouble had been remedied. Subsequent samples have indicated the absense of soil bacteria.

The chemical examination of water has been reduced in volume to a necessary minimum and only where aid is sought in determining the more desirable of two or more respective sources of public supply, or in cases where filtration or other treatment is to be placed in effect, are chemical analyses made. Repeated requests for chemical analyses by private individuals or commercial enterprises have been refused, because there is not available in the laboratory a personnel and equipment for making so many tests.

INSPECTIONS AND INVESTIGATIONS.

	Number.
Filter plants and chlorinated supplies	121
Other public supplies	166
Proposed water supplies, investigations	13
Hearing	1
Sewerage systems and disposal plants	51
Proposed sewerage, investigations	4
Stream pollution, investigations	6
Swimming pools	5
Commercial spring supplies	5
General sanitation and miscellaneous	11
Railroad water supplies	6
Total	389

WATER SAMPLES EXAMINED AND REPORTED ON.

From filtered supplies, bacteriological	560
From other public supplies, bacteriological	1,393
From private supplies, bacteriological	790
Total (does not include the examinations made in city and filter plant laboratories which are reported monthly)	2,743

NOTE.—In addition, forty-one samples were analyzed chemically in connection with special investigations.

PRINCIPAL WATERWORKS AND SEWERAGE PROJECTS COMPLETED OR UNDER WAY.

A. NEW WATER FILTRATION PLANTS.

1. Arlington county—1½ million gallons, plans approved.
2. Bedford city (population 3,243)—Completed in June, 1921, at cost of about $45,000.00.
3. Catawba Sanatorium—Filter equipment ordered.
4. Galax (population 1,240)—Engineer retained to prepare plans.
5. Norfolk—12 million gallon filtration plant, contract awarded in June.
6. Orange (population 1,078)—Completed in July at a cost of about $70,000.00 (including force main).
7. St. Paul (population 574)—Plans approved.
8. Virginia Beach—Aerating and filtration plant completed in July, at a cost of about $10,000.00.

B. PRINCIPAL EXTENSIONS AND IMPROVEMENTS.

Abingdon—New sewage system.

Bacova (industrial community)—
- New water supply.
- New sewerage system and disposal plant.

Berryville—New impounding reservoir; construction under way.

Bristol—Agreement between two cities to employ consulting engineer to prepare report.

Charlottesville—Report by consulting engineer on additional water supply.

Coeburn—Plans approved for—
- New waterworks system.
- New sewerage system.

Harrisonburg—Additional water supply; construction begun; estimated cost about $65,000.00.

Norfolk—New impounding reservoir and supply main nineteen miles long.

Piedmont Sanatorium—New sewage disposal plant.

Richlands—Bond issue of $38,000.00 for new water supply.

Stuart—New reservoir.

PERMITS ISSUED.

PLACE	DATE	FOR	REMARKS
Bacova	March 16	Sewage plant	Under construction. To serve village industrial corporation.
Buffalo Ridge	Dec. 15	Water— Terry spring	Church home and school.
Catawba Sanatorium	March 24	Filter plant	Construction not yet begun.
Chase City	Nov. 7	New Well No. 3	Additional water.
Coeburn	July 18	Water—New system	Construction not yet begun.
Coeburn	July 18	Sewage—New system	Construction not yet begun.
Fordwick	August 18	Water—New well	Addition to present supply of industrial corporation.
Lynchburg	Feb. 23	Water from tunnel—United Cigarette Company.	Industrial corporation supply.
Manassas	Aug. 5	Water—6 in. drilled well	Addition to present public supply
Monroe	Nov. 18	Water—Filters and chlorinator, Southern Railway Co.	Improvement to present system of Railway Company.
Moss	Aug. 30	Water—Equipment and improvement to filter.	Construction not begun.
Norfolk	Oct. 30	Water	Under way.
Norfolk	June 6	Water— 12 million gallon filtration plant.	Under way.
Orange	April 15	Water—Construction 'of filter plant.	Placed in service in July.
Pulaski	Nov. 5	Auxiliary supply from Peake creek.	Equipment installed but not operated yet.
Schuyler	June 15	Temporary water supply	Industrial corporation village.
St. Paul	Aug. 9	Water works system	Construction not begun.
Virginia Beach	July 14	Aerating filter plant	Iron removal and filteration.
Williamsburg (W. & M. Col.)	Nov. 5	New pumping equipment.	
Williamsburg (W. & M. Col.)	June 15	Swimming pool	Plunge in girls' dormitory.
Williamsburg (W. & M. Col.)	Aug. 5	Swimming pool	Filtration and Ultra Violet Ray Sterilizer.
Virginia Beach	June 14	Installation water works system Waverly Cottage.	

TABLE No. 1—MUNICIPAL WATER SUPPLIES.

PLACE	Population 1920	SOURCE	Treatment	No. of Inspections	Samples No. of Days	% Samples Over 100 Bacteria per cc.	% Samples B. Coli Confirmed		
							1 cc.	10 cc.	50 cc.
Abingdon	2,532	Springs	Cl.	4	13	23	15	15	15
Aldie	180	Spring							
Alexandria	18,060	Watershed	Fil-Cl.	5	Daily				
Altavista	1,206	Springs	Hypo.	3	10	3			
Appalachia	2,036	Watershed		1	3	33		33	33
Andover	220	Watershed	Hypo.	1	1	100			
Arno	1,200	Watershed	Hypo.						
Arnold	800	Watershed	Hypo.		2	100	50	50	100
Dumbar	800	Watershed	Hypo.						
Imboden	1,000	Watershed	Hypo.						
Osaka	1,200	Watershed	Hypo.		1	100	100	100	100
Roda	1,500	Watershed	Hypo.	1					
Ashland	1,299	Wells		1	6	83			17
Austinville	200	Spring	Cl.		1				
Basic	2,212	Spring		2	3	67			
Waynesboro	1,594	Spring	Cl.	2	3	67			
Bassetts	200	Well			1	100		100	100
Bedford	3,243	Watershed	Fil.	3	7	43	14	43	72
Berryville	1,138	Watershed		1					
Big Stone Gap	3,009	Watershed		1	3				
Blacksburg	1,095	Spring	Cl.	1	2				
Big Bethel			Fil.	4	1	100			
Blackstone	1,381	Wells		3	15	67			7
Bowling Green	463	Well			1				
Bridgewater	914	Spring		2	6	100	17	33	50
Bristol	6,729	Springs	Cl.	1	11	72	9	18	27
Buchanan	802	Watershed	Cl.		3	33		67	67
Buena Vista	3,911	Watershed			4		25	50	100
Burkeville	514	Well		1	2	50			
Christiansburg	1,641	Springs							
Cambria	662	Springs	Cl.						
Cape Charles	2,517	Wells			8	38			12
Castlewood	150	Spring			1	100			100
Cedar Bluff	533	Spring							
Charlottesville	10,688	Watershed		2	20	65	5	15	40
Chase City	1,646	Wells		1	10	100		40	50
Chatham	1,066	Springs		3	7	57	43	57	57
Chilhowie	572	Spring		1	7	85	57	100	100
Claremont	572	Well		1	2	50		50	50
Cleveland	220	Spring		1	1	100			
Clifton Forge	6,150	Watershed		1	3	67			
Clinchco	1,050	Watershed	Fil.		25	32	4	8	8
Clinchfield		Mine	Fil.	1	4	75	25	75	75
Coeburn	884	Springs		2	3				
Colonial Beach	1,093	Well			1	100			
Colonial Heights		Springs		1	7	29	43	57	57
Covington	5,623	Watershed	Cl.	2	4	50	25	25	25
Crewe	2,097	Wells		2	5	60			
Crockett	218	Springs		1	2	50			
Crozet	800	Well		1	1	100			
Culpeper	1,819	Watershed	Cl.	1	7	43		14	43
Damascus	1,599	Springs		1	4	100	40	50	100
Dante	811	Watershed and well.	Softened		14	72	35	43	50
Danville	21,539	Dan River	Fil.	6	48	37	42	10	17
Dayton	482	Spring	Cl.	2	1	100	100	100	100
Dorchester	171	Well and spring		1	1	100	100	100	100
Dublin	395	Well			3	100		33	33
Eagle rock	526								
Moore L. Co		Spring			2	50		100	100
Eagle R. Co		Spring			2	100			50
Edinburg	568	Spring		1	2	50			50
Elkton	905	Spring			1	100			100
Emporia	1,869	River	Fil.-Cl.	2	15	27			13
Fairfield	(See Seven Pines.)								
Farmville	2,586	River	Fil.-Cl.	4	26	4			4
Ft. Meyer	1,050	River	Fil.	1					
Franklin	2,363	River	Fil.-Cl.	2	14	7			
Fredericksburg	5,882	Watershed	Cl.	1	12	17		8	32
Fries	2,029	Watershed	Fil U.V.R.		10	20			20
Front Royal	1,404	Watershed	Fil-Hypo.	2	19	16			

TABLE No. 1—Continued.

PLACE	Population 1920	SOURCE	Treatment	No. of Inspections	Samples No. of Days	% Samples Over 100 Bacteria per cc.	% Samples B. Coli Confirmed 1 cc.	10 cc.	50 cc.
Riverton	720	Watershed	Fil.-Hypo.		19	16			
Galax	1,250	Well	Cl.	2	7	14		14	29
Gate City	684	Springs		1	4	75			
Gladstone	60	Spring				33	17	33	33
Glasgow	376	Watershed		1	1	100	100	100	100
Gordonsville	594	Springs		1	3	33	33	33	33
Graham	2,752	Water shed	Cl.		10	30		10	20
Grundy	394	Spring							
Grottoes		Well		1					
Harrisonburg	5,875	Dry River		2	5	20			
Honaker	755	Springs		2	1	100	100	100	100
Hopewell	1,397	Wells and river	Fil.-Cl.	4	Dail	y exa	minat	ions.	
City Point	66	Wells and river	Fil.-Cl.	1					
Hot Springs	1,010	Springs		2	20	70	15	50	75
Houston	411	Well		1	2	100		50	50
Irvington	1,035	Well							
Jonesville	1,326	Spring			1	100			
Keokee	1,000	Watershed		1					
Kenbridge	543	Well			1				
Kilmarnock	420	Art. well							
Lawrenceville	1,439	Creek	Fii.-Cl	2	11	18			
Lebanon	469	Spring		1	2	40	50	50	100
Lexington	469	Watershed			1				
Leesburg	1,545	Spring and well		2	9	55	11	33	67
Louisa	289	Well		1					
Luray	1,381	Watershed	Cl.	2	6	83	16	33	67
Lynchburg	29,956	Watershed	Fil.	2	302				3
Manassas	1,305	Well		1	1	100			
Marion	3,253	Springs		1	4	75			25
Martinsville	3,746	Creek	Fil.	1	24	34		4	8
Millboro	110	Spring		1					
Monterey	313	Watershed			2	100	50	100	100
Mt. Jackson	500	Springs		1	3	33			
Narrows	1,141	Creek and spring		3	6	33		17	17
New Castle	702	Springs							
Newport News	35,596	Lakes and watershed	Fil.-Cl.		335	2			6
Buckroe Beach	162	Lakes and watershed	Fil.-Cl.						
Hampton	6,138	Lakes and watershed	Fil.-Cl.						
Hilton Village	113	Lakes and watershed	Fil.-Cl.						
Old Point		Lakes and watershed	Fil.-Cl.						
Phoebus	3,034	Lakes and watershed	Fil.-Cl.						
Ft. Monroe	1,265	Lakes and watershed	Fil.-Cl.						
Langley Field		Lakes and watershed	Fil.-Cl.						
Norfolk	115,777	Lakes	Fil.-Cl.	1	Dail	y exa	minat	ions.	
Ocean View	881	Lakes	Fil.-Cl.						
Norton	3,068	Creeks		1	3	33			
Onancock	1,974	Well			2	100		50	50
Orange	1,078	Well	Cl.	2	22	55	5	14	33
Pearisburg	537	Springs		1	3	67	33	67	67
Pennington	940	Springs		1	3	100	67	67	100
Petersburg	31,002	River	Fil.-Cl.	4	202	4	9	8	4
Pocahontas	2,591	Creek	Cl.	1	16	38	13	25	25
Portsmouth	54,387	Lakes	Fil-Cl.	3	130			1	
Suffolk	9,123	Lakes	Fil.-Cl.						
Berkley	5,000	Lakes	Fil.-Cl.						
Pinners Point	1,575	Lakes	Fil.-Cl.						
Pulaski	5,277	Wells	Cop.Sul.	3	3	33			
Quantico	1,011		Fil.	5					
Radford	4,627	River	Fil.-Cl.	3	14	36	7	7	14
Reedville	980	Well			3	77		67	67
Richlands	1,171	River			10	60	20	30	60
*Richmond	171,667	River	Fil.-Cl.	5	Daily	exam	inatio	ns at	plant
Roanoke	50,842	Springs		6	1				
Vinton	2,779	Watershed			Made	by Ro	anoke	Labo	ratory
Rocky Mount	1,076	Wells		2	6	33		17	33
Round Hill	359	Spring							
St. Paul	574	Spring			3	67	33	67	67
Salem	4,159	Springs	Cl.	2	8	75		25	50
South Salem		Spring			5	80			
Saltville	1,070	Springs	Cl.	1	15	67	13	40	53

TABLE No. 1—Continued.

PLACE	Population 1920	SOURCE	Treatment	No. of Inspections	Samples No. of Days	% Samples Over 100 Bacteria per cc.	% Samples B. Coli Confirmed		
							1 cc.	10 cc.	50 cc.
Schoolfield...........	3,225	River................	Fil.-Cl. .	8	120	35	12	23	25
Scottsville...........	329	River................	Fil.-Cl. .	2	16	56	13	25	31
Seven Pines..........	?	Wells................	....	......	......	......	......	......	......
Shenandoah..........	1,895	River................	Fil.-Cl. .	1	8	63	12	25	38
Smithfield...........	1,181	Well.................	....	1	7	100	......	......	......
South Boston........	4,338	River................	Fil.-Cl. .	2	28	11	......	3	11
South Hill..........	1,074	Well.................	....	......	2	......	......	......	......
Staunton.............	10,617								
Buttermilk Spring	....	Spring...............	Ch.......	2	10	20	......	......	12
Gipsy Spring.......	....	Spring...............	Cl........	......	8	12	......	......	12
Stonega..............	2,500	Wells................	Cl........	1	6	50	16	33	50
Strasburg............	650	Spring...............	....	1	2	50	......	......	50
Stuart...............	401	Spring...............	....	2	4	100	......	50	50
Tazewell.............	1,261	Springs..............	....	1	2	50	......	......	......
North Tazewell.....	626	Spring...............	....	1	2	100	50	50	100
Timberville..........	277	Spring...............	....	2	3	67	......	67	67
Urbanna..............	387	Well.................	....	......	1	100	......	......	......
Virginia Beach (town)	846	Wells................	Fil.-Cl. .	13	9	78	11	22	45
Virginia Beach (Casino)...........	?	Wells................	....	1	......	......	......	......	......
Wakefield............	734	Well.................	....	2	2	50	......	......	50
Warrenton...........	1,545	Wells................	....	1	14	93	36	57	64
West Point...........	1,635	Well.................	....	......	1	100	......	......	......
Williamsburg.........	2,462	Wells................	....	2	19	58	11	32	32
Winchester...........	6,883	Springs..............	Cl........	2	......	......	......	......	......
Rouse Spring.......	....	....	....	......	7	43	14	43	43
Town Spring.......	....	....	....	......	7	43	14	29	29
*Ginter Park (Suburb)	....	Wells................	....	1	4	......	......	......	......
Woodstock...........	1,580	Springs..............	....	3	2	50	50	50	50
Wytheville...........	2,947	Spring...............	....	4	6	100	16	50	67
Warm Springs........	300	Spring...............	....	1	3	100	67	67	67

TABLE No. 2—INDUSTRIAL CORPORATIONS, ETC.

PLACE	Population 1920	SOURCE	Purification	No. of Inspections	Samples No. of Days	% Samples Over 100 per cc.	% SAMPLES B. COLI CONFIRMED IN		
							1 cc.	10 cc.	15 cc.
Bacova	300	Wells	......	1	11	82	9	9	9
Blackey	165	Wells	......	......	......	......	......	......	......
Blackwood	600	Watershed	......	......	......	......	......	......	......
Covington									
W. Va. P. & P. Co.	......	River	Fil	2	9	78	33	33	67
Tannery	......	Wells	......	......	1	100	......	......	......
Cripple Creek	175	Spring	......	......	......	......	......	......	......
Crewe (N. & W.)	......	Well	......	1	1	......	......	......	......
Drill	500	Springs	......	1	......	......	......	......	......
Exeter	800	Well	......	......	......	......	......	......	......
Fieldale	261	Stream	Fil.-Cl.	1	3	100	......	......	......
Flinn	200	Well	......	......	1	......	......	......	......
Jewell Ridge	521	Well	......	......	......	......	......	......	......
Keysville	......	Well	Fil	......	7	100	43	43	43
Kire (N. & W.)	......	Spring	......	......	2	50	......	......	......
Low Moor	1,125	Well	......	......	......	......	......	......	......
Luray	......	City supply filtered	Fil.-Cl.	1	2	50	......	......	......
N. & W. Ry.									
Mineral	625	Wells	......	1	3	33	33	33	100
Arminus Mine.									
Monroe	314	......	Fil	1	10	60	30	50	60
Putnam Spring	32	Spring	......	1	2	100	100	100	100
Raven	200	Wells	......	1	......	......	......	......	......
Red Ash	250	Wells	......	1	......	......	......	......	......
St. Charles	400	Wells	......	......	......	......	......	......	......
Schuyler	320	Spring	......	......	16	60	6	25	38
South Clinchfield	......	Creek	Fil.-Cl.	1	......	......	......	......	......
Int. Coal Co.	......	Well	......	1	......	......	......	......	......
Va. Hardwood Co.	......	Spring	......	1	......	......	......	......	......
Shenandoah									
N. & W. Ry	......	......	Fil	1	8	25	......	......	......
Salem									
Leas & McVitty	......	Well	......	......	......	......	......	......	......
Tannery	......	......	......	......	......	......	......	......	......
West Norfolk	......	Well	......	......	3	67	......	......	......
Whaley	......	Well	......	......	2	100	......	......	......
Wilder	......	Stream	Soft-Fil.	......	1	......	......	......	......
Konnarock	517	Springs	......	1	4	25	25	25	50
Boykins	......	Well	......	......	......	......	......	......	......
Boissevain	......	Wells	......	......	4	100	50	50	50
Clinchfield	......	Mine	Fil	1	4	75	25	75	75
Big Island	256	Springs	......	1	12	83	25	67	75

TABLE No. 3—INSTITUTIONS AND LARGER SCHOOLS.

PLACE	SOURCE	Purification	No. of Inspections	Samples No. of Days	% Samples Over 100 Bacteria per cc.	% Samples B. Coli Confirmed in 1 cc.	10 cc.	15 cc.
Ashland—								
Randolph-Macon	Well			1	100			
Blacksburg—								
V. P. I.	Spring	Cl.		2				
Blackstone—								
Girls' School	Well			2	50		50	100
Military Academy	Well			4	100			
Bon Air—			H					
Industrial School	Springs		1	11	64	18	37	64
Bethany Home	Spring		1	2	100		50	50
Buffalo Ridge—								
Baptist State Mission S.	Spring			4	75		50	75
Burkeville—								
Piedmont Sanatorium	Spring		4	4	75			
Ingleside Seminary	Spring			1				
Catawba Sanatorium	Watershed and spring	Cl.		30	17			7
Chatham—								
Training School	Spring		1	1	100			
Episcopal Institute	Wells		1					
Charlottesville—								
Blue Ridge Sanatorium	Aux. spring		2	5	60		30	60
Covington—								
Boys' School	Spring	Cl.	2	6	50	16	16	33
Emory—								
Emory and Henry Col.	Spring	Cl.		3	67			
Ferrum—								
Ferrum Training School	Springs		1	5	80	20	40	80
Fork Union—								
Fork Union Training School	Spring			1		100	100	100
Hampton-Sidney—								
Hampden-Sidney College	Creek	Cl.	1	4	50	25	25	25
Hollins—								
Hollins College	Watershed		1	1	100	100	100	100
Laurel—								
Industrial School	Well							
Maidens—								
Industrial School	Spring		2	2		50	50	100
Marion—								
Southwestern State Hospital	Spring		1	1	100		100	100
Peakes—								
Industrial School	Spring		1	7	30		30	30
Petersburg—								
Central State Hospital	Canal	Fil.-Hypo.	6	15	20	7	7	7
Normal and Industrial Inst.	Well and springs		5	1				
Richmond—								
Masonic Home				1	100			100
Hartshorn College	Spring and well			4	75			50
Rock Castle—								
St. Emma's Industrial Col.	Creek and wells	Fil.		1	100			100
Rocky Mount—								
St. Peter's Mission School	Well		1	1	100			
Staunton—								
Va. S. for D. & B.	Spring		2	4	75	25	25	50
Western State Hospital	Spring	Cl.	1	9	67	33	33	44
Sweet Briar—								
Sweet Briar Institute	Spring and well		1					
Williamsburg—								
Eastern State Hospital	Wells		2	3	100			33
William and Mary College	Well		2	2				
Varina—								
Varina School	Well		1	3	33			
Ivor—								
High School	Well		1	1				

WATER SUPPLIES.

Principal Investigations and Improvements During Year Ending September 30, 1921.

ARLINGTON COUNTY.

Arlington county is the most densely populated county in Virginia, with an area of thirty-seven square miles and population of 18,000. Strictly speaking, it is a suburb of Washington.

By an act passed by the General Assembly of 1920, this county was designated as a sanitary district, and a board appointed to regulate all matters pertaining to sanitation and welfare. The board was empowered to appoint a chief engineer to have necessary investigation, survey and plans made for water and sewerage systems, and divided the county into subdivisions and zones.

Early this year the engineer retained by the board submitted a report on a proposed water supply. This report, and the preliminary plans accompanying same, were approved by this office.

For economy in operation, the county was divided into four zones, as follows:

Zone No. 1. With a reservoir located at Fort Richardson to supply a low service section between elevations 0 and 200.

Zone No. 2. With standpipe at Rosslyn to supply part of the district between elevations 0 and 235.

Zone No. 3. With reinforced concrete covered reservoir on Hall's Hill to supply an area between elevations 100 and 350.

Zone No. 4. With standpipe on Hall's Hill to supply a high service district in which elevation ranges from 350 to 450.

The plans provided for a pumping station and a rapid sand filtration plant (capacity 1½ million gallons per day) at Rosslyn. The supply is to be delivered by pumping from Pimmit run. The intake will be located opposite Chain bridge. The length of force chain from intake to filter plant will be about five miles. An emergency intake will be located in the Potomac river at a point just above Three Sisters.

BEDFORD CITY.

Early in 1920 the town of Bedford City retained engineers to design a filtration plant to purify the water supply derived from Little Stony creek and Stony creek at Peaks of Otter. The water is conveyed by gravity through 8 and 10-inch C. I. pipes to a concrete reservoir on hill south of town.

Construction of filtration plant was commenced in September, 1920, and completed and put in operation June 1, 1921.

The plant is located alongside concrete reservoir and consists of a concrete mixing chamber, capacity 3,750 gallons, concrete coagulating basin, capacity 54,000 gallons, two concrete gravity type filter units, capacity 500,000 gallons each, one unit is fully equipped with loss of head gauge, rate controller (Simplex type), the second one is blocked in for future extension of plant.

The coagulating devices consist of two concrete alum tanks and one iron soda tank with the necessary solution and orifice feed boxes.

A motor-driven centrifugal pump is used to raise water for washing purposes to a 30,000 gallon elevated steel tank located close by.

The water after filtration is sterilized by means of liquid chlorine.

It is interesting to note that during May a number of cases of dysentery developed daily, while as soon as filtered water was turned in the town system no further cases developed.

BERRYVILLE.

During the year the town has begun the construction of a rock filled dam to provide for about three million gallons storage in addition to the 600,000 gallons stored in the existing reservoir.

As explained in a former report, the supply is taken from a catchment area of about two square miles, on which there are about four or five inhabited dwellings. Consequently, there is always the danger of an infection of the supply by one of the people living on this area or by some visitor. The town authorities have been urged to provide chlorine apparatus for sterilizing the supply.

BIG BETHEL FILTRATION PLANT.

The Big Bethel filtration plant was built by the United States government during 1918-1919 for the purpose of supplying Langley Field and Fort Monroe with water for all uses, is located at lower side of dam built at headwaters of the southwest branch of Back river and about 2¾ miles west of center of Langley Field reservation.

This plant supplied water to Fort Monroe for about a month and to Langley Field up to May, 1921.

Several inspections were made during the months of September, November, and December, 1920, for the purpose of investigating the operation and sanitary conditions of plant.

The following conditions were noted and recommendations made:

1. Filter beds in bad condition. Upper twelve inches of sand full of aluminum hydrate and organic matter.
2. Retention period of coagulating basins too short, causing overloading of filter beds.
3. One rate of flow controller and loss of head gauges out of order.
4. Ineffective aeration devices.
5. Poor coagulation on account low alkalinity.
6. High CO_2 content of raw water due to decaying vegetable matter in reservoir, standing timber, etc.

Recommendations.

1. That layers of sand mixed with aluminum hydrate be removed and sand level of filters be raised to bottom of wash troughs by the addition of new sand.
2. Construction of wood stilling walls in coagulating basins.
3. Installation of proper aerator nozzles.
4. Repairing of loss of head gauges and controller.
5. Installation of a dry feed machine for application of lime, so as to get better coagulation.

6. Installation of orifice boxes for application of alum solution.

7. Installation of float gauges showing depth of solution in alum tanks also water level in coagulating basins.

8. Connection of Venturi recording devices with Venturi tubes in raw water lines to aerator.

9. Installation of sump pump or other means of drainage in pipe gallery.

10. Clearing of reservoir area of timber, floating islands and vegetation.

11. Careful laboratory control of operations of plant.

Central State Hospital.

The work of installing the equipment of second filter unit, additional low and high service pumps, contracts for which were let last year, has been completed under the supervision of this division.

Report and plan were made by this division on additional fire protection, including the following recommendations, at an estimated cost of $12,000.

1. New fire service pumps to be located in old station. One motor-driven 1,000 g. p. m. centrifugal pump, capable of furnishing 75-pound pressure at nozzle. One gasoline-driven 1,000 g. p. m. pump, same as above.

2. New 10-inch force main C. I. from pumps to connect with pipe system in grounds.

3. Disconnecting present 8-inch force main where the same connects with 6-inch pipe around main building and continuing same to tanks, making independent connection to water tanks.

4. Placing of check valves in lines to tanks, so same will be cut off from system when fire pumps are working.

5. Hydrants at Ashleigh Grange colony on present 8-inch raw water main. By closing Valve "A," as shown on sketch, sufficient pressure can be developed by pumps at canal, to serve two to three hose streams at about thirty pounds. This will save the laying of another pipe line a distance of nearly one-half mile.

Charlottesville.

Since the bond issue of last year, nothing has been accomplished with regard to securing additional water, with the exception of resuming operation of the old pumping station, which was abandoned in 1904, but started up again for a few months in 1920.

The odors and tastes due to algae have been even more objectionable than in previous summers, also the discoloration of the water by iron—caused apparently by excessive CO_2. For these reasons citizens generally have criticized conditions and several civic organizations, particularly the Rotary and Business Men's Clubs have appointed committees to investigate the relative merits of various plans under consideration.

At the present time the supply is collected from a small watershed having an area of 1,200 acres, all owned by the city and protected against pollution. There are two impounding reservoirs, the upper one built in 1887, having a capacity of about 150 million gallons, and the lower one completed in 1908, with a capacity of about 500 million gallons. These are located about 3¾ miles west of the center of the city. From the old reservoir a 6-inch supply main goes to the University and a 10-inch main to the city. From the lower reservoir there is an 18-inch suppline line to the city.

The firm of consulting engineers retained last year recommended the following extensions and additions:

1. Intake works and pumping station on Ivy creek at a point about 6,000 feet west of the lower reservoir. After sedimentation, coagulation with alum when necessary, and sterilization with chlorine, this supply would be delivered into the lower reservoir.

2. Aerating plant, show sand filter and high service reservoir on Observatory Hill just west of the city. The elevation of these would be higher than the flow line in impounding reservoir.

Booster pumping station opposite Observatory Hill.

In the report it was clearly stated that the Ivy creek supply was recommended for temporary use until such time as the consumption would justify a gravity line from Moorman river, and that when such time should come only the pumping station on Ivy creek would be abandoned. The remainder of the improvements were designed with the Moorman river in view as an ultimate source of supply.

Some of the local officers have been discussing a county proposition to use the Rivanna river water and construct a filter plant. By request, this office examined the various reports and the data available. At a meeting of the advisory board, the statement was made that the Rivanna river project was feasible but would be more expensive in the long run than a gravity supply from Moorman river, also that the scheme recommended by the consulting engineers (with the exception of certain minor changes in arrangement) appeared logical and to the best interests of the city.

Briefly—Ivy creek has a catchment area of about eight square miles above the proposed intake, on which there are a dozen or more houses. Above the proposed intake on Moorman river the catchment area is about twenty-three square miles, on which there are only five or six houses. The latter supply is soft, seldom very turbid, and can be delivered to the impounding reservoir by gravity. If this supply is secured in the near future, it would seem advisable to locate the intake high enough to deliver water to the high service reservoir by gravity and to locate the aerating plant and filter near the impounding reservoir. This would require pumping from the impounding reservoir to the filter, but only for short intervals during the next ten or fifteen years.

To date, no definite plan has been adopted.

CULPEPER.

The public water supply furnished by the town authorities is still very unsatisfactory, being subject to considerable pollution by people and animals, and muddy for weeks at a time. The only safeguard against an epidemic of typhoid fever is the chlorination plant located in the pumping station.

About two years ago the local authorities retained a firm of consulting engineers to prepare plans and specifications for a filtration plant. When bids were received for building the plant, it was found that sufficient money was not available.

The supply is taken from a small stream known as Hungry run, which has a catchment area above the intake of seven square miles. On this area are located forty-three houses, one schoolhouse, and one church. There are approximately 225 people living constantly on the watershed and many others who pass over it along the public roads. Practically all of the houses have unsanitary surface privies, and the drainage from these and also from the stables and hogpens goes directly into the supply. As an illustration, one field through which Hungry run flows contains forty hogs which have access to the water and wallow in it in hot weather. In the field just above the intake there are thirty or forty head of cattle during the summer months.

During the summer water is also taken from Mattock's branch, also polluted, and from Mountain run.

The local authorities have under consideration another bond issue to cover the cost of filtration plant.

GALAX.

The water is derived from a number of springs located about 9,000 feet east of Galax and conveyed through a 2½-inch pipe line to a collecting basin located west of the town. About 16,000 gallons per day is available from this source.

Near the collecting basin there is an 8-inch drilled well about 200 feet deep. When first tested, the flow was about forty gallons per minute, but at the present time it is only twenty gallons per minute, or 28,800 gallons in twenty-four hours.

The combined supply from the springs and well is pumped into a 100,000 gallon concrete reservoir located on a hill not far from the station.

During the past summer, the quantity of water available was not sufficient to meet the needs of the town. By request from the local authorities, Mr. Wagner, assistant engineer, was detailed to make an investigation of the conditions and offer such suggestions as he could with regard to securing more water. His recommendations were as follows:

1. Construction of a filtration plant on Chestnut creek just above the town for a permanent supply.
2. Temporary use of the Chestnut creek supply with treatment by chloride of lime.

Mr. Wagner assisted the town authorities in locating and starting the pumping station and setting up the sterilizing plant.

GLASGOW.

In accordance with order issued July 19, 1920 (see last annual report), a hearing was held at Glasgow on October 5th.

The Glasgow Company admitted the conditions as described in the order, but denied responsibility, explaining that the waterworks system had been installed by the Rockbridge Company at the time of the boom in 1890-91, and that when the Glasgow Company took hold of the property the waterworks system was not included. However, it was shown that the agent for the company had receipted for monthly payments for water, which would indicate responsibility.

As a result of the hearing, the town and company reached an agreement with regard to the value of the system, and the town purchased it early this year.

HARRISONBURG.

Anticipating a shortage in the supply, the city, early this year, appropriated about $65,000 for an intake pipe line to Rocky run, an emergency intake on Dry river, and for about three and one-half miles of 12-inch pipe to parallel the present 10-inch main. Ultimately the 12-inch line will be extended all the way to the city.

Since 1897 the water has been drawn from Dry river at a point about thirteen miles northwest of the city. The regular intake is located about 200 yards from the stream and all water which reaches it, except during flood flows, must filter through sand and gravel. Consequently, the sanitary quality of the supply has always been good. The catchment area above the intake is about fifty-six square miles, on which there are only a few habitations. A public road follows the stream for a considerable distance and crosses it in several places.

In 1917 an additional supply was recommended to be taken from the Gum run watershed, which has an area of about eighteen square miles and is uninhabited. A suitable site about three-fourths mile from the present intake was selected for an impounding reservoir. While the project was under discussion the property changed hands and it was decided to postpone it for a while and secure additional water from Dry river and Rocky Run.

In a letter to the chairman of the water committee, attention was called to the risk of using water taken directly from Dry river because of the potential danger of infection of the supply by people living on or traveling over the watershed. It was strongly recommended that the emergency supply be sterilized with chlorine or that a slow sand filter be constructed. The latter method is practicable under existing conditions, since sand is available in the vicinity.

LURAY.

An inspection of the supply in July showed that there has been no improvement in the condition on the watersheds. The chlorinator purchased last year has been out of commission during the winter months and was not started until June. On the morning of July 27th, the date of inspection, the machine was found out of order and had to be shipped back to New York for repairs. While this was being done, a chloride of lime plant was set up for emergency use.

The two sources of supply are described briefly as follows:

Stony Man Supply.—Taken from a small stream which has its origin at spring located on Skyland property. Possibility of pollution by people from the Skyland resort who roam over the watershed, and also leakage into the 12-inch gravity tile line approximately one and one-half miles long between intake and storage reservoir. At present time this source probably furnishes only twenty-five per cent of the water used.

Mary' Rock Supply.—Taken from a stream having a watershed of about 2.9 square miles on which there are half a dozen habitations and a store. Much of the land on either side is cultivated. A public road follows parallel to the stream for a distance of about a mile. This supply is at all time subject to pollution by human beings, drainage from hogpens and stables and at any moment may become infected by a typhoid carrier or person suffering with typhoid or dysentery. From the intake, the supply is conveyed by gravity to the storage reservoir through a cast-iron pipe 18,700 feet in length, part of which is 6-inch and the rest 4-inch in diameter.

Reservoir.—Located about three and one-half miles from town and has a capacity of about two and three-fourths million gallons. The two supplies enter through separate inlets at the far end and the outlet to town is from the middle.

Chlorination.—In August, 1914, a hypochlorite plant was installed at the reservoir as an emergency measure and operated for two or three months. The same type of apparatus was set up several succeeding summers, but has not been used during the winter months. Last season it was decided to install a liquid chlorine machine. A representative from the Wallace and Tiernan Company, who visited Luray, submitted a plan for an installation suitable for the conditions. At that time the Ludlow Engineers were making an investigation of the supply and pending their report, the offer of the Wallace and Tiernan Company to furnish a chlorinator for temporary use was accepted, until the engineering report should be completed. The town was advised at the time that this was only temporary equipment not adapted for the efficient treatment of the water under the existing conditions. It appears that the machine was retained and set up again this year early in June. At the time of inspection it was out of commission and being packed for shipment to the factory for repairs. In view of the emergency a hypochlorite apparatus was set up in its place.

Last year, at the suggestion of this office, the council retained a firm of consulting engineers to make a complete investigation of the waterworks system, with recommendations as to needed improvements. The report, dated August 14, 1920, contained the following recommendations concerning the need of purifying the supply:

"That a duplicate chlorinating plant with automatic control proportionate feed, properly housed, shall be installed and faithfully operated near the storage reservoir; and that this installation should be made immediately. The estimated cost is $4,000.00.

"That a modern gravity type rapid sand filter plant would be a highly desirable adjunct to the water supply plant. This should be located near the reservoir and consist of two units of approximately 250,000 gallons per day each. With the filter plant it should be necessary to provide a clear water storage of not less than 60,000 gallons to provide for the extra needs during fire fighting and to provide for wash water in the operation of the filters. While we would urge that in all respects a filtration plant would be much more desirable than a chlorinating plant alone, yet with the installation and faithful operation of the chlorinating plant herein recommended, we do not consider the need of filtration to be particularly immediate or pressing. While it would yield a much more desirable physical quality of water than a chlorinating plant will furnish, it would not greatly exceed the effectiveness of chlorinating insofar as the elements of hygienic purity are concerned. In consideration of the comparatively slight turbidity and other physical contents of the water after the normal period of detention in the reservoir, and in view of the limited income derived from the water supply, as well as the limitations on your financial resources, we have chosen to recommend, for the present at least, the chlorinating plant instead of a filter plant. We would recommend, however, that filtration should be anticipated as a future installation when the demand of your citizens for improved physical qualities of the water supply shall become more insistent than we understand it to be at present. This demand will doubtless come in due course of time and in keeping with good public policy it should be met. The estimated cost of a suitable filtration plant at present price is $20,000.00."

In the first recommendation given above attention should be called to the specification for two machines, so in case one breaks down the other can be used; also automatic control so that chlorine can be applied in proportion to the flow of water and thirdly to a proper house, one that can be kept warm in winter. It is impossible to effectively sterilize the supply with the present equipment even during the summer and not at all during the winter.

So far, the town officials have not taken any definite action. The situation is of especial interest because of the large number of summer visitors who use the water. During the present season there have been about a dozen excursions to Luray from Washington and other places.

NARROWS.

No funds are available for the installation of a public water supply, and an agreement was reached with the Union Tannery Company to permit the town to utilize the surplus water from Mill creek over and above that needed by the tannery. The proposition was briefly as follows:

1. To extend the present intake to a point on Mill creek above a farm house, which at present is practically the only source of pollution above the existing intake.
2. To make a connection between the present tannery supply main and a reservoir to be constructed by the town.
3. To locate the pipe line entering the reservoir so as to receive only such water not required by the tannery.
4. The town to chlorinate the supply if found necessary after the moving of the intake.
5. The town to make a survey of the lands along the creek above intake and obtain permission from the land owners in addition to consent of the Tannery Company.

On March 30th, it was found that the town had taken no steps to make the changes recommended above, although a few of the citizens were endeavoring to form a private company and obtain a supply entirely independent from that owned by the tannery company. It was found that there was an available supply from Hopkins Springs, located about one and one-half miles south of the town, and that the suppply could be delivered by gravity to a reservoir located on a hill near the town. Unfortunately, it was impossible to raise the necessary funds for building the works.

In July, at a conference attended by Mr. Enslow, assistant engineer, the mayor, and several of the leading citizens, it was decided to go back to the first scheme and take advantage of the offer made by the Tannery Company, provided a sufficient amount of funds could be obtained by popular subscription to construct a reservoir and the necessary pipe lines.

ORANGE.

The rapid sand filtration plant begun last year has been completed.

Prior to last year, the water supply had been taken from a deep well and from some springs. The quantity was insufficient to meet the needs of the town, and the quality was not all that could be desired. For this reason, it was decided to go to the Rapidan river about three miles away.

The location selected for the intake and filter plant is about 300 feet below the point where the sewage from Woodberry Academy was discharged.

As the result of a conference between Mr. Enslow, President Walker, of the academy, and representatives of the town, permission was given for the town to extend the sewer line so as to discharge below the proposed waterworks intake.

The plan was completed and operation started about the middle of July. Careful efficiency tests were made, and the attendants were given instructions with regard to operation and necessary records. The bacteriological tests made since then have shown that the plant is turning out very good water.

Briefly, the plant consists of the following:

Raw water pump, centrifugal 250 g. p. m.—coagulating basin 33,000 gallon capacity. Circular wooden filter 227 square feet area. Clear well under filter building, capacity 27,600 gallons. Liquid chlorine machine.

Force main 6-inch flayed pipe 3.4 miles long from pump station to town. (Flanged pipe is used because this was available at about half the cost of new cast-iron pipe.) The static head on the pumps is about 443 feet.

The total cost of improvements is about $70,000.00.

VIRGINIA NORMAL AND INDUSTRIAL INSTITUTE, PETERSBURG, VA.

An investigation of the water system showed that the supply available from the springs and well on the ground was inadequate, and the quality of the water questionable. The population (colored) varies from about 700 to 1,000.

Since the institute is located just outside the city, it was recommended that arrangements be made with the city to furnish water and the institute to install a booster pumping station, pipe lines and hydrants for fire protection, which was entirely lacking.

By request, this office prepared the designs and specifications, and ordered most of the materials. The cost of the improvements complete was about $10,000.00.

Plans for a trunk sewer to serve new buildings under construction and future buildings were also prepared by this office.

QUANTICO.

Investigations of the United States government filtration plant supplying the marine camp with water were made by an engineer of this division. The following defects were noted:

(a) Filter surface covered with mud balls.

(b) Cones of gravel extending to surface of sand bed, allowing unfiltered water to enter clear well.

(c) Short circuiting of coagulating tanks, due to insufficient height of baffle walls.

(d) Rate controllers not operating.

(e) Lack of soda tanks resulting in occasional acid effluent.

As soon as these matters were called to the attention of the officers in charge, the defects were remedied, and orders were given to carry out suggestions with regard to the operation of the plant.

RADFORD.

The pressure filtration plant of the Radford Water Power Company is still turning out occasionally an unsatisfactory effluent, although the gravel and sand has been removed, graded, washed and replaced, and other weak features eliminated, yet this plant, owing to the character of the New river water is not capable of producing a clear and at all times safe water, due to lack of coagulating basin and impossibility of chlorinating the effluent.

The company is at the present time trying to negotiate a new franchise to enable them to rehabilitate the waterworks by the construction of a gravity type filter plant, the laying of more supply mains, etc.

ROCKY MOUNT.

The town is at present facing a serious water shortage. The present water supply consists of two deep wells located about 1,000 feet apart. The water from wells is pumped by motor driven deep well pumps into pipe distribution system and 100,000 gallon elevated steel tank.

These wells were driven in 1913. The system was placed in operation in 1916. At that time the wells were furnishing about 60 g. p. m.

The present combined flow of wells does not exceed 30 g. p. m. or about 40,000 gallons per day.

The population of Rocky Mount last census was 1,976. The daily consumption (if water were available) would be from 75,000 to 100,000 gallons.

As a result of an investigation by this division, the town was advised to secure a supply from Pig river and to construct a filtration plant having a capacity of 250,000 gallons per day.

RICHMOND.

The quality of the water as furnished, due to high amount of dissolved and suspended organic matter, aluminum hydrate, etc., and the consequent large application of liquid chlorine to effectually sterilize the water, imparting to it a disagreeable taste and odor, is not only unattractive but most times quite unpalatable.

Studies were carried out during the year by this division.

Description of Treatment Works.

About five miles above the city, a low concrete dam across James river diverts the water through headgates and 2,000 feet of feeder canal to two settling basins. These basins are about one mile long. The average depth is eight and one-half feet with varying widths from thirty feet at head to 400 feet at lower ends; capacity of each basin is eighty-five million gallons.

From settling basins the water is drawn through two small mixing chambers—at which point the alum is applied—into two concrete coagulating basins with a capacity of fifteen million gallons each. Only twelve million gallons are available, however, as these basins can be drawn down only within two feet of floor to prevent the deposited aluminum sludge entering the conduit.

From the basins the water is conveyed through a 50-inch concrete flume laid in the bed of the James river and paralleling the Chesapeake and Ohio Railway a distance of 5,200 feet to pump stations.

A canal furnishing water power to old pump station extends along and between settling basins and bluff line of river from above diverting dam to pump station. This canal now intercepts all drainage and sewage from Tuckahoe creek, Grants creek, Westham creek and suburban territory west of the city.

The coagulating basins are operated on the draw and fill system.

In 1910 about seven hours' time was consumed in coagulating and filling. Average time basins stood and cleared was fourteen hours; average length of time basins of clear water supplied pumps was twenty-one hours.

During August, 1921, the average time consumed in coagulating and filling—seven hours.

Average time basins stood and cleared—5 hours 31 minutes.

Maximum time basins stood and cleared—14 hours 15 minutes.

Minimum time basins stood and cleared—1 hour 0 minutes.

The basins were put in operation in 1910.

The daily average gallons of water treated in 1912 was 13,258,571.
The daily average gallons of water treated in 1920 was 16,910,000.
The maximum daily average gallons of water treated in 1912 was 15,729,667.
The maximum daily average gallons of water treated in 1920 was 18,700,000.
The maximum daily average gallons of water treated in 1921 was 19,400,000.
The average turbidity per month in 1921 was—
River, 53; storage basins, 12; clear water basins, 2.
The average turbidity August, 1921, was—
River, 48; storage basins, 17; clear water basins, 2.7.
The average color August, 1921, was—
River, 29; storage basins, 33; clear water basins, 8.2.

The following changes were recommended and carried out:

More frequent inspection of chlorinator.

Increased number of samples from different points for bacteriological analysis.

New form of daily laboratory and operation report.

Duplicate chlorinator, etc.

TABLE OF OPERATION, SETTLING BASINS, 1921.

MONTHS	Number of Runs	Gals. Water Treated	Average per Day	Average per Run	Alum Gr. per Gal.	Chlorine ppm.
January	40	483,620,000	15,600,000	12,900,000	1.39	0.77
February	37	449,064,000	16,038 000	12,137,000	0.98	0.69
March	40	495,830,000	15,904,000	12,395,000	1.24	0.65
April	37	459,720,000	15,324,000	12,410,000	1.38	0.74
May	41	489,006,000	15,774,000	11,927,000	1.62	0.69
June	46	553,521,000	18,450,000	12,032,000	2.37	0.63
July	48	569,483,000	18,370,000	11,622,000	2.61	0.74
August	50	601,463,000	19,402,000	11,566,000	2.41	0.79

TURBIDITY

MONTHS	RIVER			SETTLING BASIN			COAG. BASINS			RES. MAIN		
	Max.	Min.	Ave.	Max.	Min.	Ave.	Max.	Min.	Ave.	Max.	Min.	Ave.
January	300	5	143	50	5	22	2	1	2	3	1	1.7
February	250	4	103	35	5	11	2	1	2	2	1	1.1
March	200	6	43	50	6	22	2	1	1.4	2	1	1.4
April	550	3	76	80	15	15	4	......	2	2	1	1.5
May	550	15	137	40	6	19	2	1	1.3	2	1	1.6
June	600	18	162	200	8	49	5	1	2.5	3	2	2
July	450	45	216	200	10	72	4	1	2.6	3	2	2.1
August	150	7	48	30	4	17	6	2	2.7	3	2	2.2
COLOR												
January	40	25	32	35	30	32	10	6	7	7	5	5.7
February	32	16	26	32	20	25	9	5	6	6	4	5.2
March	40	18	24	28	18	23	8	4	6	8	4	6.7
April	45	18	29	35	18	25	9	4	5	9	5	7
May	42	20	27	35	22	28	8	5	7	9	5	7
June	50	25	35	48	25	37	10	6	8.5	10	7	8
July	50	30	38	46	30	37	11	7	8	9	8	8.1
August	35	18	29	37	10	33	15	7	8.2	9	7	8
ALKALINITY												
January	37	13	28	35	27	31	25	17	20	......	......	......
February	46	22	33	37	24	33	31	15	25	......	......	......
March	49	30	38	42	31	37	35	20	28	......	......	......
April	46	33	41	43	37	40	34	24	30	......	......	......
May	45	26	39	42	35	38	31	22	26	......	......	......
June	60	30	47	54	29	45	42	15	31	......	......	......
July	58	36	49	58	30	49	43	21	30	......	......	......
August	72	50	62	67	50	60	52	30	42	......	......	......
OXYGEN CONSUMED												
April	......	......	......	......	......	......	3.2	1.7	2.3	......	......	......
May	......	......	......	......	......	......	3	1.6	2.2	......	......	......
June	......	......	......	......	......	......	5.8	1.7	2.9	......	......	......
July	......	......	......	......	......	......	4.3	2.1	2.8	......	......	......
August	......	......	......	......	......	......	5.2	2.4	3.9	......	......	......

TABLE OF OPERATION SETTLING BASIN AND LABORATORY.

Bacteria Per CC.

MONTHS	River			Settlg. Basin			Coag Basin			Chlor. Water			Sand i e			Res. Main		
	Max.	Min.	Ave.	Max.	Min.	Ave.	Max.	Min.	Ave	Max.	Min.	Ave.	Max.	Min.	Ave.	Max.	Min.	Ave.
January	3,000	30	581	600	......	123	100	2	21	10	......	3	9	......	4	11	......	5
February	900	30	294	200	10	74	250	......	32	14	......	2	16	......	3	30	......	6
March	900	30	164	150	10	56	100	......	18	17	......	2	11	......	3.4	200	......	14
April	3,000	60	504	250	20	108	90	......	24	9	......	2	70	......	5	200	......	1.2
May	3,000	90	625	400	......	138	300	4	59	20	......	3	19	......	4	200	......	28
June	6,500	110	990	900	40	239	400	14	67	30	......	5	15	......	4	300	6	68
July	4,500	250	935	800	70	213	500	25	100	38	......	4	25	......	6	600	16	74
August	7,500	60	1,263	1,700	......	289	270	......	72	170	......	7	13	......	4	2,000	6	189

B. Coli Per CC.

	0.1	1	10	0.1	1	10	0.1	1	10	0.1	1	10	0.1	1	10	0.1	1	10
January	53.8	95	......	10.3	56.4	97.5	5.1	5.1	20.5	......	......	......	......	......	......	......	......	......
February	47	89.2	......	8.1	47	97.3	......	2.7	21.6	......	......	......	......	......	......	......	......	......
March	15	80	......	......	17	65	......	......	12	......	......	......	......	......	......	......	......	......
April	32.4	81	......	5.4	21.6	54	......	......	16.2	......	......	......	......	......	......	......	......	1.8
May	33.3	89.7	......	7.7	17.9	71.8	......	......	15.4	......	......	......	......	......	......	......	......	6.8
June	37.8	82.2	......	6.7	37.8	71.1	2.2	2.2	8.9	......	......	......	......	......	......	......	......	1.9
July	47.9	98	......	6.3	50	81.2	2.2	6.6	45.8	......	......	......	......	......	......	......	......	4
August	27.9	53.8	......	3.8	23.2	50	......	......	19.2	......	......	......	......	......	......	1.9	1.9	5.8

The conclusions reached were:

(a) That present unsatisfactory quality of water as delivered is due entirely to insufficient capacity and therefore overloading of settling basins.

(b) The best and most economical method to improve the water will be by filtration.

The benefits resulting from the use of filtered water will be manifold.

1. Filtration will reduce the amount of aluminum sulphate per million gallons with a consequent reduction of free CO_2.

2. The amount of chlorine necessary to completely sterilize the filtered water can be reduced at least sixty per cent.

3. The reduction of both free CO_2 and hypochlorous acid will materially reduce the red water trouble, especially in the high service district.

4. Total elimination of aluminum hydroxide which is now present occasionally in large quantities in treated water.

5. The elimination of mud deposits on bottom and sides of the low service reservoir. This mud forms an ideal breeding ground for bacteria and during warm weather putrifies to some extent.

6. Freedom from danger of epidemics of water-borne diseases and which is now constantly present in the high service district due to possible interruption of chlorination by clogging of orifices, etc., of machine.

7. Elimination of bad tastes and odors, due to present high chlorination.

8. Delivery at all times of a clear, sparkling and wholesome water.

SCHOOLFIELD.

Investigation of the filter plant owned by the Riverside and Dan River Mills Company and the improvements made at that time were noted in the last annual report. This year the plant has been turning out a much better water than formerly. However, the Filter Manufacturing Company have expressed the opinion that the coarse sand sizes O. A. to 1.0 m. m. will give satisfactory results and that the trouble has been because of the present operating methods. As soon as certain changes (noted below) are completed, more thorough tests will be made to determine this point.

The last inspection of the plant showed the following conditions:

1. Operators more efficient and taking more interest. One of the operators is a graduate in sanitary engineering.

2. The alum application was being more carefully controlled. Artificial alkalinity was being obtained by adding a mixture of eighty per cent pulverized limestone and twenty per cent of air-slacked lime. Coagulation has been much better since this method was adopted. Readings of turbidity throughout the plant are being made, and the basins and filter effluent carefully watched.

3. Filters are being washed daily with a 20-inch rise of wash water, which will be increased to 24-inch as soon as the installation of the new wash water pump is completed.

4. Filters are being operated at as near a uniform rate as possible without the use of rate controllers. This is accomplished by taking the drop in the filters with a gauge and setting the effluent valves to obtain the desired rate.

5. Sample taps have been placed on the filter effluent line and piped to a central point where the operator can observe the quality of the filtered water at all times.

6. The piping of two old filters has been changed so as to secure a greater rate of wash.

7. Sterilization carefully controlled by making chlorine tests at hourly intervals.

The following improvements are scheduled to be made in the near future:

1. A stilling wall in the coagulating basin.

2. Loss of head gauges will be installed if it is desired to substitute a smaller size of sand. If this is not done, the loss of head gauges will not be necessary in view of the fact that filter will pass turbid water before the maximum permissable loss of head is reached.

3. New wash water pump.

4. Duplicate chlorinator.

5. Arrangements with the city laboratory for bacteriological tests two or three times a week.

STUART.

The water supply is derived from two springs located in the Blue Ridge mountains about one mile north of the town. One of these springs has a flow of thirty-seven gallons per minute and the other seventeen gallons per minute. The storage reservoir just below the springs has a capacity of about 100,000 gallons.

The following recommendations in regard to improvements were acted on and completed.

1. The springs were walled in and water conveyed directly to the reservoir through pipe lines.

2. Reservoir lined with concrete.

Sketches showing the method of making the above improvements were submitted with the report.

The supply is now considered one of the best in the State.

VIRGINIA BEACH.

During the past year an iron removal and filter plant has been constructed.

At the time this question came up, it so happened that the city of Norfolk was remodeling their filter plant, and offered to turn over to the Virginia Beach authorities at a nominal charge several of the old filter units and necessary equipment for same. The city also loaned an experienced superintendent and skilled labor for the construction of the plant.

The raw water is taken from thirty-nine driven wells, all of which are eighteen feet deep. These are located about one mile from the center of the town. The principal trouble with the supply has been on account of the iron in the water as it comes from the wells and the very high CO_2 content which was found to run as high as 100 to 125 p. p. m. This CO_2 caused corrosion of the cast-iron pipe mains, and the water which reached consumers has always been highly discolored and had an objectionable taste.

The plant was completed and operation begun on June 29th. A representative from this division was present for the purpose of making analytical tests and giving instructions for the operation. Since then, several visits have been made to determine the efficiency of the treatment.

Briefly, the plant consists of the following:

1. Raw water pump—Duplex.
2. Aerator—Four spraco nozzles, in wooden supply tank with splash platform.
3. Chemical feed—Emulsion of slaked lime added to aerated water.
4. Coagulation tanks—Two circular wooden tanks, parallel, containing mixing chamber, baffles and stilling wall.
5. Filter—Circular wood filter, fifteen feet in diameter.
6. Clear water basin with circular wood tanks beneath the ground surface.
7. High service pump—The filtered supply is pumped to an elevated tank.

On July 2nd, 4th, 7th and 26th a series of tests indicated very satisfactory operating efficiency.

By aeration alone the carbon dioxide was reduced from 125 to fifteen parts per million, and iron from 2.2 parts per million to a trace only. The addition of lime is necessary to further reduce the carbon dioxide content, and also to reduce the load on the filter and to prevent air binding of filter. Hypochlorite of lime was added at the same point the lime solution was applied. However, since the raw water is of a very good quality from a bacteriological standpoint, the chlorine treatment has been discontinued.

Prior to starting the plant, samples of water were taken from the service taps in town and contained from 11 to 14 p. p. m. of iron. On July 6th, only a trace of iron was found in samples taken from the same taps.

On account of the bad quality of the water before the iron removal plant was installed, the citizens were using commercial spring water of doubtful quality, and had to wash clothes in rain water collected in cisterns.

On July 26th, about a month after the plant had started operation, the town water was being used for all forms of domestic requirements, including the making of tea, which is one of the most severe tests to which water can be put.

By special request, this division furnished sketches showing the design of the plant, and gave advice during the construction.

WINCHESTER.

During the year a firm of consulting engineers have submitted a detailed report, with recommendations and estimates of cost on paving, water supply, lighting, sewerage, boundaries street and zone districts.

In an endeavor to find a sufficient supply of soft water, the engineers investigated every available source within a radius of twenty miles, but unfortunately no such supply was found which could be delivered to the city at a reasonable cost.

A summary of the report on water by the consulting engineers is quoted as follows:

Water Consumption.

(1) The present consumption of water in Winchester is excessive and large quantities of water are being needlessly wasted.

(2) The margin of water available for your supply over that actually used is too small to safeguard the town against possible shortage of water.

Old Pumping Station.

(3) The two older boilers at the pumping station are practically worn out and are of such an obsolete type that you are not warranted in spending the money required to thoroughly repair them.

(4) The new boiler in the pumping station is in good condition and should be held at least for the present to be used in conjunction with your two steam pumps as a reserve unit.

(5) The application of chlorine to the water supply as at present arranged is unsatisfactory in that the amount of chlorine must be controlled by hand operation and be varied with the number of pumps in use.

(6) An additional electric pump should be installed in the present pumping station, which new pump can be used in the development of the improved water supply as recommended in this report.

(7) There is no available means of determining accurately the amount of water that each pump is discharging into the mains, and there is, therefore, no method of choking the efficiency of the various pumps to determine if they are operating properly. Inefficient machinery increases the cost of pumping, and with no means available to check the efficiency of the pumps, they may operate in an inefficient manner for a long period.

Discharge Main and Distribution System.

(8) The discharge main from the pumping station is entirely too small to economically carry the amount of water discharged from the pumping station. With all three pumps operating, you are discharging theoretically at least 1,700 gallons of water per minute, and the economical size of this discharge line should be sixteen inches or eighteen inches. The result of this small pipe line is that a large part of the coal burned and of the electricity consumed in the station is used in overcoming friction in the discharge line.

(9) Your distribution system is not adequate to properly distribute the water throughout the town in order to give proper fire protection to the different districts. Long four-inch lines are prevalent, and while this will furnish sufficient water for domestic supply, it will not give an adequate amount of water for fighting fires.

Storage of Water.

(10) The reservoir capacity at present available is entirely too small for safeguarding the town against accidents to the pumping station or force main, or for giving adequate protection against large fires.

Condition of Present Supplies.

(11) The water from the town spring is unsatisfactory for domestic consumption without some adequate means of purification.

(12) The water from the present sources is so hard that your citizens are put to a great deal of needless expense in the use of this hard water.

Increased Water Supply.

(13) There is no available source of soft water which can be brought to the town without both pumping and filtration, with the exception of the springs near Wardensville, a distance of over thirty miles from the town, which would not need filtration. The water from these springs, however, would have to be pumped over the ridge which is between Wardensville and Winchester.

(14) The cheapest soft water supply would cost to develop approximately $750,000, and in addition to this large first cost, would require high operating expenses in filtering and pumping the water.

(15) There is no source of supply, either hard or soft, which can be brought into town by gravity. All of the streams and springs which are high enough up on the mountainside to flow by gravity into Winchester are too small to be used as a source of supply for the city.

(16) The nearest and most economical supply available is from Merriman Spring to the west of the town.

Water Softening.

(17) The water supply coming from Rouse spring and the increased supply which could be taken from Merriman spring, can be softened at a cost which will be economically profitable to the people of Winchester.

Present Cost of Pumping by Steam and Electricity.

(18) There is little to choose between the present cost of pumping by steam and electricity, the cost of steam pumping being slightly less than electric pumping. It is possible to introduce machinery, both electrically driven and steam driven, which will operate more economically than the present steam and electrically driven equipment. As the first cost of the electrically driven equipment is only a fraction of the cost of the steam-driven equipment, we would recommend that the electrical equipment be installed rather than the new steam equipment.

(19) If the cost of coal is $5.00 per ton and electricity is 2 cents per kilowat, the cost per day of operating a steam pumping station, including interest and sinking fund, would be at least $3.00 per day more than the cost of an electrically operated station.

RECOMMENDATIONS.

In view of the above conclusions, we beg to submit the following recommendations for improving the water supply system of Winchester:

Water Consumption.

(1) That immediate steps be taken to meter all services taking their supply from the city. By doing this the city will save money in operating expenses, interest and sinking fund charges as soon as the improvements are made, and large capital expenditures in the near future will be avoided, as is shown by the charts showing capital expenditures and operating charges, interest and sinking fund to carry out the required improvements for a period of twenty-five years. The installation of meters, by cutting down the water consumption, will also have the same effect as would an increased supply of nearly one-half million gallons per day.

(2) We recommend that a new rate for water on the meter basis be worked out so that this rate would produce a revenue sufficient to pay all operating expenses, interest and sinking fund charges.

Old Pumping Station.

(3) That no attempt be made to repair the two old boilers in the present pumping station, and that the new boiler, for the present at least, be held in reserve with the two steam pumping engines.

(4) That a new electrically-driven pump be installed in the old pumping station to have a capacity of 700 gallons of water per minute. This new pump can be used for the present to pump water into the mains and the old reservoir. The motor required to drive this pump will be of seventy-five horsepower capacity—the pump itself to be of piston type and not of the centrifugal type. The efficiency of such a pump should be at least eighty-seven and one-half per cent as compared with about seventy per cent for a centrifugal pump. The increased cost of a piston pump would soon be paid for in the saving of the electricity required to drive it. The approximate cost of this pump and motor installed would be $7,000.00.

(5) That a Venturi meter be placed on the discharge line from the pumping station so that you will have a means of accurately checking the amount of water actually being pumped by any one pump or any combination of several pumps. The cost of installing this meter would be approximately $1,500.00, and this amount of money would very soon be returned due to your ability to check up very quickly anything that may go wrong with any of the pumps. At the present time, one of your pumps may be pumping only a little more than one-half the water which it should pump when in good condition. It costs just as much to pump this half amount of water as it would to pump the full amount, but unless you have some means of checking the efficiency of the pumps, it is possible to go on for several weeks or months operating a pumping unit on a very inefficient basis.

(6) That an automatically controlled chlorinating apparatus be substituted for the hand-operated machine. This will do away with the possible and probable overdosing and underdosing.

Discharge Main and Distribution System.

(7) If the city carries out the program of improvements herein outlined, we do not recommend the enlargement of the present discharge main, as a new discharge main is recommended from the old pumping station to the proposed new water softening plant.

(8) That a careful study be made of the entire distribution system, and a layout be made looking to the future development of new territory, but providing for reinforcement of the existing system by new connections and the possible replacement of some of the small four-inch mains with piping of a large size. With such a carefully prepared plan, all future extensions can be made in such a way that the work need never be duplicated or replaced.

Storage of Water.

(9) The plan of improving the water supply herein outlined provides for a storage of new spring water at the water softening plant of 1,000,000 gallons. With this reservoir constructed, there will be no need for water storage at Rouse spring. In addition to the reservoir at the water softening plant, we also recommend the construction of a new reservoir of 3,000,000 gallons capacity on the hill west of the city and adjacent to the existing reservoir.

Condition of Present Supplies.

(10) The present supply from Rouse spring can be greatly improved, both in regard to its use for drinking purposes and for domestic purposes, by the installation of a water softening plant. Such a plant will not only soften the

water, but will purify it also. We, therefore, recommend the installation of a water softening plant in connection with the other improvements, as outlined in the following paragraph:

Increased Water Supply.

(11) In order to increase your supply, we would recommend that the Merriman spring be developed as an increased supply in conjunction with Rouse spring. This improvement would call for a spring basin at Merriman spring, with a pipe line leading from the spring to the water softening plant located west of the Valley pike alongside of the stream which flows from Merriman spring. In the water softening plant a 1,000,000-gallon open reservoir should be constructed to receive the water from Merriman spring and the water which would be pumped from Rouse spring. The old pumping station at Rouse spring with some new equipment can be used to pump the water from Rouse spring through a new discharge line to the water softening plant located as above. The water would be drawn from the open reservoir into the water softening plant, and a pumping station, electrically driven, should be built which would pump the water into a new reservoir recommended in paragraph 9. Our measurements of the flow from Merriman spring and Rouse spring show that these two springs are about the same size, so that your water resources would be nearly doubled by the development of these springs, as recommended.

The town spring could be held as a reserve, and if it should be placed in constant use, a small water softening plant could be built to treat the water from this spring.

(12) We would also recommend that steps be taken immediately of the funds on hand to secure the necessary property and water rights required in connection with developing the Merriman spring as a source of supply.

(13) If satisfactory arrangements cannot be made to secure the property and water rights in connection with Merriman spring, we see no other available source of supply within close proximity of the city. The two closest sources of supply are from the spring one-half mile west of Vau Cluse and called Stephens spring, and the spring located in Marlboro. Both of these springs, however, are from lime stone country, and would give the same hard water as Rouse and Merriman springs. If the city goes as far as these springs to develop a source, we recommend that it go a little further and take the water from Cedar creek, which is naturally much softer than would be the water from these springs. The water from Cedar creek is not only comparatively soft, but the flow comes from the very extensive watershed and even in the driest seasons will probably not fall below 5,000,000 or 6,000,000 gallons of water per day. We, therefore, recommend the development of this source of supply if satisfactory arrangements cannot be made for developing the Merriman spring supply.

WESTERN STATE HOSPITAL, STAUNTON, VA.

The water used for domestic purposes is brought by gravity from several springs located about two and a half miles southwest of the hospital. The quantity is adequate for all domestic needs in ordinary seasons, but during the summer months when the flow of the springs is at a minimum, additional water is obtained from the city supply.

The water used in toilets and for fire purposes is taken from a drilled well 330 feet deep located on the grounds. In connection with this well supply, there is a two million gallon reservoir located on a hill just south of the hospital.

Following an investigation of the power plant, building, etc., the following recommendations were made:

Power Plant—(a) New fronts to two of boilers; (b) spring safety valves to replace lever pop valves; (c) larger boiler feed pump, and (d) iron girders to carry steam pipes.

General—(a) New fire hose; (b) sanitary drinking fountains; (c) individual or paper towels in place of roller towels; and (d) map showing location of buildings and all underground piping.

On the whole, the hospital was found to be in a clean and sanitary condition.

EASTERN STATE HOSPITAL, WILLIAMSBURG, VA.

In connection with the water supply, Mr. Wagner made a study of the power plant, with a view of finding out what changes were necessary.

The water supply is derived from three wells, having depths of 280 feet, 280 feet, and 700 feet, respectively. The supply is lifted by compressed air from these wells into a million-gallon concrete reservoir, and from this reservoir the water is pumped to an elevated steel tank having a capacity of 34,000 gallons.

The pipe line from one of the wells for a distance of 200 to 300 feet is of wood fibre, and it was recommended that it be replaced with cast-iron pipe so as to avoid any possibility of contamination of the supply by the infiltration of surface water.

Test of the high service centrifugal pump showed a reduction of fifty-two per cent in the rated capacity. The pump and motor are exposed to dust from coal and ashes, and should be placed in a better location.

The hospital has a separate system of pipe lines and hydrants for fire service. The fire pump has a capacity of 1,400 gallons per minute. The suction of this pump is connected to the reservoir supply and also to a collected basin which is filled with water from storm sewers. In case of a break down in the regular centrifugal pump, the fire pump can deliver reservoir water into the domestic supply system. With such an arrangement, there is always danger of contamination of the domestic supply. Therefore, the large pump should never be used except for fire service, and the cross connection should be removed.

Power Plant.—The power plant building, in which all machinery is housed, is a two-story structure, partly of wood and partly of brick.

SEWERAGE AND STREAM POLLUTION.

PRINCIPAL INVESTIGATIONS DURING YEAR ENDING SEPTEMBER 30, 1921.

ARLINGTON COUNTY.

The report (mentioned under water, Arlington county) submitted by the engineers, contained recommendations with regard to sanitary sewers for serving the present and future population, and described the method by which the sewage should be treated before being turned into the Potomac river. The last question required careful consideration because of the policy adopted by the District of Columbia of gradually building interceptors parallel with the river and pumping the sewage to an outfall several miles below the city.

The recommendations are summarized briefly as follows:

1. Division of the county into thirteen sanitary zones with trunk sewers leading to three separate outfalls with a treatment plant at each.

2. *Four Mile Run Plant*—To be located near point where Richmond, Fredericksburg and Potomac railroad crosses Four Mile run, and plant to comprise rack screens, grit chambers, four sedimentation tanks (each 100 x 15 x 8.5 inches deep) and sludge drying beds. The tanks are designed to have a two-hour detention period for each tank when receiving the entire flow and for operating the several tanks in rotation. The sludge will remain in the tanks until all four units have been in service—a period of eight or nine months—during which it should become digested.

The estimated maximum flow provided for the next few years is 800 gallons per minute. As soon as this flow shall be reached, additional tanks, each having double the capacity of one of the small tanks, will be constructed and two of the smaller tanks operated as one unit. When the time comes for another extension, new tanks will each have the capacity of three of the small tanks. This scheme of enlargement may be carried on indefinitely. The estimates and preliminary location plans show tanks to take care of 7,500 gallons per minute, equivalent to about ten million gallons per day.

3. *Arlington Junction Plant.*—To serve the town of Potomac and adjoining territory. General features of design similar to that for the Four Mile run. Flows assumed are 400 gallons per minute at the beginning and an ultimate flow of 1,000 gallons per minute.

4. *Little River Plant.*—To be located opposite Anacostan island and effluent to be discharged into Little river. Similar to other two plants. Sewerage flows assumed, 1,000 gallons per minute for next few years, and ultimately flow of 4,000 gallons per minute.

BACOVA.

This is an industrial community established by the Tidewater Hardwood Corporation. The company has built and owns all the houses, and has provided water sewerage and other sanitary conveniences for their employees and their families. The ultimate population will probably not exceed 300.

The water supply is taken from several wells on the property. The supply is not yet entirely satisfactory because of iron which causes objectionable tastes and discoloration. The company is investigating whether a new supply from a distance will be cheaper than an iron removal plant.

The branch which receives the sewage is small and consequently a sewage plant has been constructed.

Briefly, it comprises a plain settling tank, separate sludge digestion tank, dosing tank, trickling filter and sludge drying beds. The plant is modern in every respect and can be operated to secure efficient results.

BLACKSBURG, VA.

Investigation of sewage treatment plant which serves the town and the Virginia Polytechnic Institute was made by Messrs. Enslow and Messer, May

17th, 19th and 20th. Assistance in making the test was given by Professor R. H. B. Begg, Mr. A. B. Massey and Mr. W. W. Watkins. The latter continued the tests for a period of about two weeks after May 20th.

Population.—The combined population of the town and institute is estimated to be 2,100, of which 1,750 is served by the sewerage system. During the summer when the institute is closed the total population is about 1,000.

Quantity of Sewage.—The quantity of sewage received at plant was measured at various times during the period of test and found to be as follows:

Total maximum daily flow 261,000 gallons.
Total minimum daily flow 221,900 gallons.
Maximum per capita (population 1,750)=149 gallons.
Minimum per capita=126 gallons.

Apparently considerable ground water is leaking into the system and in all probability the maximum daily flow during periods of wet weather is considerably greater than the above figures.

Sewage Treatment Plant.—The plant comprises an Imhoff tank and four contact beds. The Imhoff tank has a settling capacity of 2,220 cubic feet with detention periods based on the sewage flows varying from 0.9 hours to 2.4 hours.

The velocity through the tank varies from eighteen to forty-eight feet per hour. The sludge compartments have a total capacity of 3,250 cubic feet.

The total area of the four contact beds is 6,132 square feet=0.14 acres. The filter material consists of broken stone not passing one-inch mesh screens. The beds are emptied and discharged by automatic feeds and timing siphons located in a central chamber. Usually each bed is filled three times a day and the interval from the time a bed stops filling until it starts emptying ranges from six to eight minutes.

The most noticeable features in connection with the Imhoff tanks are the excessive quantities of scum which accumulate in the tank and the small quantities of accumulating sludge. It appeared from the information given by those in charge that very little sludge has been drawn off during the past five years, that most of the solids have come to the top of the tank in the form of scum. During the past year and perhaps longer it has been necessary to remove scum by shovelling into wheelbarrows about every five weeks at a cost of approximately forty-six cents per day. It was believed that the large quantities of scum were due partly to the fact that the sewage which reaches the plant is fresh and in part to its large grease content; also to the fact that whenever the sludge has been drawn very little was left in the hoppers for seeding purposes. The operator stated that it had been his custom to open the sludge pipes wide during heavy rains when the creek was flush and keep them open until the level of the sewage in the tank was even with the sludge outlet.

On April 2-4, scum was removed completely from the tanks and on May 18th the quantity of scum and condition were noted as follows:

Compartment	Thickness	Acid Alk.*	Odor	Color	Surface Scum Below Top of Tank	Remarks
A	6 ft. 6 in.	Acid.	Putrid	Light Grey	6 ft.	Not digested
B	4 ft. 6 in.	Slightly acid.	Some	Grey	6 ft.	Beginning to digest
C	2 ft.	Neutral	Slight	Dark grey	12 ft.	Fairly well digested
D	1 ft.	Alk	Slight	Dark grey	12 ft.	Failrly well digested
E	2 ft 0 in.	Acid	Putrid	Light	8 ft.	Not digested
F	1 ft. 6 in.	Neutral	....	....	9 ft	....
G	12 in.	Neutral.......	Slight	Dark Grey	9 in.	Fairly well digested
H	6 in.	Alk.	Slight	Dark grey	10 in.	Fairly well digested

*Acidity and alkalinity of scum obtained by testing with litmus paper.
Comparts A and E are near end of tank, D and H near outlet end.

The quantity of scum as given in the above table amounted to 1,359 cubic feet=to 30.9 cubic feet per day=1.0154 per capita per day=42,100 gallons of scum per 1,000 population per year.

On the same day the sludge pipes were opened but there was no sludge in the bottom of the tank.

All scum was removed from tank on May 19th and records of accumulations were kept until June 1st as shown in table below.

Record of Scum Accumulations.

Date	a	b	c	d	e	f	g	h
May 19...........	....	....	....	....	....	....	....	....
May 23...........	2 ft. 3 in.	1 ft. 9 in.	6 in.	6 in.	2 ft.	9 in.	6 in.	4 in.
May 26...........	4 ft. 3 in.	2 ft. 4 in.	1 ft.	1 ft.	2 ft. 8 in.	10 in.	8 in.	6 in.
May 30...........	6 ft.	3 ft 6 in.	2 ft. 4 in.	1 ft. 5 in.	3 ft. 6 in.	1 ft. 3 in.	1 ft	10 in.

NOTE.—Scum in sections e to h inclusive, was broken up each day to May 26th.
Sections a, b, c, d are on one side of tank while e, f, g, h are on opposite side.

Chemical and Bacteriological Examinations.

Chemical and bacteriological examinations are given in the following tables:

Settling Solids by Imhoff Conical Glass.

Date	Sample	Time Taken	Period	Reading cc. per Litre.
May 18.............	Raw sewage.......	12.00	2½ hrs	8.0 cc.
May 18.............	Tank effl..........	10.08 A.M	2 hrs.	.6 cc.
May 18.............	Tank effl..........	2.50 P.M	2 hrs. 40 min.	.5 cc.
May 18.............	No. 1 bed effl......	3.20 P.M	2 hrs. 10 min.	.8 cc.*

*NOTE.—Solids from No. 1 bed affluent were black and flaky showing that contact beds were unloading to some extent.

Chemical Analyses.

The following results were obtained by examination of composite samples collected May 17-18, 1921. Sampling was commenced at 8 A. M., May 17th, and portions collected every two hours until 8 P. M. No portions were collected between 8 P. M. and 6 A. M., but final collections were made at 7 A. M. and 8 A. M. on May 18th. Hence the strength of the sewage as indicated by these composites is somewhat greater than the average for composite samples collected at equal intervals during the entire twenty-four hours.

	Raw Sewage		Tank Eff.		Contact Bed Eff.	
	PPM	*GPC	PPM	G.P.C.	PPM	* G. P. C.
Solids						
Total	1,100	583	614	325	554	293
Volatile	420	222	306	162	238	126
Fixed	680	360	308	163	316	167
Suspended	354	187	115	61	106	56
Dissolved	746	394	449	238	448	237
Ether Sol. Matter	143	76	63	33.	25	13
Alkalinity	324	....	306	....	308	....

*Grams, per Capita.

On the basis of the above analysis the following quantities of sludge and scum should be intercepted by the Imhoff tank.

	PPM	G. P. C.	
Suspended matter	354	187	Efficiency of tank
Non-settling matter	115	61	67-½ per cent.
Settleable solids	239	126	

Raw sewage contains 50.5 tons (dry) solids per 1,000 pop. per year.
Settleable solids 34 tons (dry) solids per 1,000 pop. per year.
Pounds per day (dry) 1,750 population — 485.
Pounds per day 90 per cent slugde and scum — 4,850.
Cubic yards per day 90 per cent sludge and scum — 2.8
Cubic feet per day per capita — .043
Gallons per day per capita — .325
Cubic yards per year per 1,000 population — 587.
Gallons per year per 1,000 population — 118,800.

NOTE.—A series of analyses would probably show that the volume of settling solids intercepted would be somewhat less than 2.8 cubic yards per day for 1,750 people. Comparison with volume of scum it is noted that average during forty-four days was 1.15 cubic yards per day, leaving some 1.6 cubic yards unaccounted for. Using the maximum figure 2.8, the tank has a sludge capacity of 120 ÷ 2.8 = 43 days for 90 per cent sludge and 65 days for 85 per cent sludge. The actual capacity is probably about fifty days with allowance for some space beneath the slot.

It was noted that during the day samples taken 239 p. p. m. of suspended matter was removed by the tank, equivalent to efficiency of sedimentation of 67.5 per cent. This is very good efficiency and what is usually expected for tanks of this type.

It will also be noted that amount of suspended matter (dry basis) as shown by these particular analyses will amount to fifty tons per 1,000 population per annum, which is about twice as much as would be expected in most sewages.

Scum—Grease Content.

	Section E Percent	Section E Percent
Moisture	80	80
Ether solid matter on wet basis	2.56	2.38
Ether solid matter on dry basis	12.70	12.90

Relative Stability at 37½ Degrees C.

DATE	Contact Bed Effluent	Creek about 200 yards below outlet
May 17	11	Less than 21
May 18	15	37
May 19	21	37
May 20	5	..

Bacteriological Aanlyses.

Samples collected May 18th at 10 A. M. Analyses by Mr. A. B. Massey.

SAMPLE	Total Count per cc (Beef peptone agar 37°C.
Raw sewage	2,000,000
Imhoff tank effluent	260,000
Contact bed effluent	450,000

Additions Recommended.

1. Grease trap near institute kitchen (constructed during summer).
2. Three additional tanks of the sedimentation type having a total capacity of 90,000 gallons.
3. Sludge pump and force main for delivering sludge and scum to an area located about 300 yards from the plant.
4. Extension of contact filters so that the total area will be 0.5 acres.
5. Chlorinating apparatus and final sedimentation tank having a retention period of about thirty minutes.

HARRISONBURG—SEWAGE WORKS.

For a number of years the sewage from the town of Harrisonburg was discharged without treatment into a small stream flowing to the southwest and emptying into North river about six miles below the present outlet.

Population—1910=4,879, and 1920=5,875.

The dry weather sewage flow is approximately 550,000 gallons per twenty-four hours, of which about 100,000 gallons (eighteen per cent) is tannery wastes. Because of valuable farms along Black's run, the city decided to treat the sewage.

Brief Description of Water.

The works comprise a reversible flow Imhoff tank (completed early in 1917); siphon chamber, capacity 72,000 gallons; six sand filters with a total area of 7,260,029 feet=1.67 acres; and sludge drying beds with total area of 8,000 square feet.

The Imhoff tank (described in Engineering News of January 25, 1917,) has settling capacity of 75,000 gallons=about 2½ hours, and a sludge capacity of 8,000 cubic feet=1.3 cubic foot per capita.

Sludge is removed at intervals varying from three to six weeks. During the twelve months, July, 1920, to July, 1921, 745 cubic yards of sludge (measured after drying) were removed. This is equivalent to 2.64 cubic yards per million gallons=9.3 cubic feet per 1,000 population per day. These quantities are somewhat higher than usually occur and are due to the tannery wastes. The sludge, when drawn, is dark in color, has the usual tarry odor, and dries quickly. There has been no foaming troubles during the year. The scum in settling compartments is broken up regularly and whenever thickness exceeds a foot it is removed from the top.

The sand filters have concrete walls and earth floors. The filter medium consists of twelve to eighteen inches of broken stone and about thirty inches of sand. Each filter has an overflow about eighteen inches above the sand level, which connects with the underchains and outfall.

Operation of the sand beds started on July 8th. Within less than a month it was apparent that the beds were clogging, in spite of scraping of the surface. As was to be expected, the rate of 330,000 gallons was entirely too high. Sewage was being turned into the beds in rotation to a depth of twelve to fifteen feet, but usually an interval of forty-eight to fifty-four hours elapsed before the liquid disappeared beneath the sand surface. Hence, the filters were acting merely as strainers. The effluent from the beds was fairly clear on August 23rd, but due to the quantities overflowing from the beds the stream was discolored.

Since the new filters have been started, adjoining property owners have been complaining of objectionable odors. At the request of the council, an investigation was made and the following report submitted on September 2nd:

The complaints of adjoining property owners concerning objectionable odors since the completion of the sand filter beds appear to be justified. The odors are most noticeable on days when the humidity is high and are carried considerable distance when there is any wind. At the time of inspection the air was clear and very little odor could be detected except in the immediate vicinity of the works.

The odors are caused by sewage standing exposed on the sand filters for periods ranging from one to three days. Consequently septic action takes place and odors are produced.

The principal fault with the plant is insufficient area of sand filter beds. At the present time there are six beds having a total area of one and two-thirds acres. To satisfactorily treat 400,000 gallons of municipal sewage at least four acres should be provided and with such a high percentage of tannery wastes probably five or six acres.

Sand filters are efficient when operated at rate not exceeding 75,000 to 100,000 gallons per acre per day, but this type of plant is too expensive for your conditions, because of the high cost of sand and the cost of maintenance. If there had been no tannery wastes to be taken care of, sprinkling filters (constructed of broken stone) would be cheaper and much more satisfactory from the standpoint of operation. Sprinkling filters, however, will not remove the color from tannery wastes while sand filter will.

The logical conclusion is to use the sand filters for treating the tannery wastes and build a sprinkling filter (about one-half acres) for taking care of the municipal sewage. Fortunately the location of the plant is such that this can be done.

In order to adopt this scheme of operation the tannery wastes should receive preliminary treatment at the tannery and storage tanks provided so that the wastes may be discharged into the outfall sewer during the night hours when the flow of the city sewage is at a minimum. To all practical purposes this will separate the city sewage from the tannery wastes. During the day hours from 6 A. M. until 9 P. M. the sprinkling filter will be used for treating city sewage and during the night hours the tannery wastes with a small proportion of city sewage will be diverted to the sand beds.

Tannery wastes contain considerable quantities of fleshings, hair, particles of lime and other suspended matter which should be intercepted at the tannery. This can be done by a properly designed settling tank, and from time to time, as may be necessary, the sludge can be drawn off onto cinder drying beds. It will be much cheaper and more satisfactory to intercept this organic suspended matter at the tannery than to attempt separating it out at the municipal sewage plant. In other words, the wastes when discharged should be of about the same strength (so far as suspended matter is concerned) as the city sewage, but will still be highly colored. The sand filters will remove the color.

In brief, the tannery company should provide a collecting storage tank having a capacity of about 100,000 gallons and a settling tank of about 50,000 gallons. These tanks may be made of wood. It will be necessary, of course, to rearrange the piping so that all the wastes can be conveyed to sumps, from which they can be pumped to the tanks. There is plenty of space on the property for tanks and drying beds. In my opinion there is no basis for the objection that such treatment will cause local nuisances. It is doubtful whether any one in the vicinity will notice any more odor than occurs at the present time.

The city has already invested about $40,000.00 for sand filters which will be used primarily for serving the tannery. It would seem proper to expect the tannery company to incur a relatively small expense for preliminary treatment.

RECOMMENDATIONS.

1. Preliminary treatment of tannery wastes at the tannery by means of the storage of wastes and a settling tank so that they will be discharged into system during specified hours.
2. Construction of a sprinkling filter on the opposite side of the creek, said filter to be built of broken stone, about six feet in depth and to have an area of about one-half acre.
3. Final settling tank for receiving effluent from sprinkling filter, said tank to have a detention capacity of about two hours based on the present average hourly flow.
4. Operation of sprinkling filter during hours 6 A. M. to 9 P. M. with tannery wastes excluded and operation of sand beds during remaining hours for decolorizing tannery wastes.

PIEDMONT SANATORIUM, BURKEVILLE, VA.

Sewage Treatment Plant.—The population at the sanatorium at present is about 125. Within the next few years, it is expected that it will be increased to about 300.

The water supply is taken from a drilled well on the grounds. The sewage is discharged into a small branch which flows in a southeasterly direction and empties into Nottoway pond about six miles below the outlet. Since this pond is used by several clubs for boating and bathing, the sewage must be treated and disinfected before it is turned loose.

The plant comprises a bar screen, an Imhoff tank, siphon chamber, hypochlorite of lime apparatus, sludge drying bed, and chemical reaction basin. The units are so located to permit the construction of a trickling filter as soon as funds are available and when needed.

The features of design are briefly notes as follows:

Sewage flow (future) assumed per hour average=2,000 gallons.

Bar screen—6 square feet clear spacing 1½ inches.

Imhoff tank—

Settling chamber=4,200 gallons=2.1 hours, with velocity of flow= 0.11 feet per minute.

Sludge chamber=590 cubic feet=2 cubic feet per capita.

Dosing tank—Capacity 600 gallons=18 minutes.

Five-inch automatic siphon.

Hypochlorite plant consists of two fifty-gallon barrels and regulating box. The hypochlorite solution is applied to effluent line from siphon chamber only when the siphon is discharging. This is accomplished by means of a float valve which opens when siphon is discharging and then closes when the sewage flow stops.

Chemical reaction chamber—Capacity 3,000 gallons, with baffle to give good distribution of flow.

During the present summer, sufficient hypochlorite has been added so that there would always be free chlorine in the final effluent. For the 12,000 gallons of sewage per day ten pounds of chemical were used, equivalent to 800 pounds per million gallons.

ROANOKE.

Several visits have been made to Roanoke with regard to finding the best location for a filter plant on the Roanoke river.

During the past two or three summer seasons the quantity of water from Crystal spring and other sources of supply owned by the Roanoke Waterworks Company has not been sufficient to meet the needs of the city. The situation has been relieved somewhat by the construction of a water softening plant by the Norfolk and Western Railway Company. The railway company is now taking water used in the roundhouses and shops from a separate source. However, it is only a question of two or three years before the city will need more water. The only supply available is from the river.

The question at issue is whether the water should be taken from a point just above Salem or from a point between Salem and Roanoke. At the request of the water company and the city authorities this division agreed to make an investigation of the situation.

Briefly, the work covered the following:

1. Sanitary survey of the catchment area above Roanoke.
2. Daily bacteriological and chemical analyses from September 17th to 23rd. Samples were collected from the river at a point just above Salem, and also from a point near Roanoke avenue bridge west of Roanoke.
3. Quantity and nature of wastes from tannery at Salem.
4. Flow records of the river, with particular reference to velocity of the stream between Salem and Roanoke.
5. Suburban development toward Salem.

Summary of Report.

The Roanoke river has a total catchment area above Roanoke of about 372 square miles, of which eighty-five per cent is above Salem.

Above Salem the river receives pollution from a total population estimated at about 10,000, which is mostly rural. The largest communities are Shawsville (1,000) and Elliston (500). In addition to the sewage pollution, wastes from three tanneries are discharged into the river during parts of the year. Between Roanoke and Salem, the principal sources of pollution are as follows: (a) About 300,000 gallons per day of sewage from the town of Salem; (b) rural population (including people in Salem not connected with sewers) of about 6,100; (c) about 82,000 gallons per day of tannery wastes which enter at Salem; (d) waste water from swimming pool and sewage located at Lakeside Amusement Park which enter the river about five miles above Roanoke.

Comparison of water at Roanoke avenue bridge with that above Salem, as shown by average figures of analyses:

	Above Salem.	*At Roanoke Ave. Bridge.*
Total bacterial per c. c.	1,600	16,000
B. coli per 100 c. c.	1,000	10,000
	P. P. M.	*P. P. M.*
Color	3	230.
Chlorides	2	6
Permanent hardness	8.2	18.5
Organic matter (oxygen consumed)	4	30
Sulphates (SO_4)	15.6	28.8

The above figures indicate a grossly polluted water at Roanoke avenue bridge. While it might perhaps not be impossible by intensive operation to carefully treat this water, yet it is a practical impossibility to satisfactorily treat it and make it satisfactory for drinking purposes by any of the methods which are known at the present time. The sewage and tannery wastes from Salem reach Roanoke avenue bridge within twelve to fifteen hours under average conditions, and within three hours during rainy periods.

The water taken from the point above Salem can be easily treated by the use of smaller amounts of chemicals than is usually required for most any supply. At Roanoke it will be impossible to remove all the color, even by the use of excessive quantities of alum, during the time the tannery liquor wastes are present. This was proven experimentally by adding different quantities of alum and lime to samples of water.

Quantity of water available from Roanoke river at point above Salem.—From report published by the United States Geological Survey, covering measurements taken at the city of Roanoke, it is estimated that the quantity of water passing Salem has exceeded thirty-five million gallons per day every day (except eleven days) during the eleven years from 1896 to 1906. In 1904, which was an exceptionally dry year, the minimum flows at Salem (on the basis of Roanoke figures) were 22.5 million gallons per day for two days. Since the city of Roanoke will not require more than ten million gallons per day for a number of years, it is seen that there is a sufficient quantity available from the river at Salem. In case additional water should be needed at any future time, it would probably be advisable to construct a storage reservoir on the river.

Treatment of Salem Sewage and Tannery Wastes.—Careful consideration has been given to the question of treatment of the tannery wastes and sewage from Salem, and whether, after such treatment, it would be advisable to place the intake at the Roanoke avenue bridge. The only argument in favor of such a program is the saving in cost of the force main from Salem to Roanoke. However, this saving would be offset to some extent by the cost of main and perhaps a standpipe or elevated tank which would be required to serve the suburban territory now being developed west of Roanoke.

The arguments against such a plan are briefly as follows: (a) The river would still receive pollution from the unsewered districts between Salem and Roanoke; (b) necessity of constructing intercepting sewers along the river, ultimately the entire distance from Salem to a point just below Roanoke avenue bridge, which probably would be more expensive than a force main; (c) uncertainty with regard to efficiency of treatment plants for tannery wastes and Salem sewage. If such plants are not very carefully operated they will not produce satisfactory effluents, and even under expert supervision they will at time be inefficient.

RECOMMENDATIONS.

In view of the conditions as summarized above and with due consideration to present and future of territory effected, it is the opinion of this division that no further consideration should be given to the location of a water intake below Salem, and that the supply should be taken from the Roanoke river above Salem.

WINCHESTER.

The sewage treatment plant, inspected on July 22nd, was found to be operating satisfactorily, but on account of wastes from the Virginia Woolen Mills, the effluent was highly discolored. The total volume of this waste is about 75,000 gallons per day. It is held in tank at the mills and released at certain hours, usually between 2 and 5 P. M. During this period the trickling filter is cut out of service and the effluent from Imhoff tank (mixed sewage and wastes) are turned onto the sand beds. The population in 1910 was 5,864 and in 1920, 6,883.

Brief History of Sewage Treatment Plant.

The sewage system was installed in 1909 and the main sewer outfall located near the junction of Town run and Abram creek, just southwest of the city. The total catchment area of these two streams is about 10.9 square miles and the probable minimum flow is about 0.8 c. f. s.=550,000 gallons per day. Abram creek flows east for a distance of five and one-half miles where it empties into Opequon creek, a tributary of Potomac river. Due to the several farms below the outlet, it was decided to provide treatment.

The treatment plant, constructed in 1909, comprised (a) bar screen; (b) siphon dosing tank (60 x 30 x 55 = 75,000 gallons); with two Miller alternating siphons; (c) two sand filter beds (each 100 x 100) with a total area of 20,000 square feet; and (d) sludge drying bed. It was soon apparent that more sand filter area would be required, and additions were made as follows—in 1911 two beds (20,000 square feet) and in 1915 an Imhoff tank and 26,000 square feet of filter area, making a total area of 1.5 acres. In 1915 the average daily flow of sewage was about 500,000, equal to a rate of 330,000 per acre per day on the sand filter.

The floors and walls of the sand filters were made of concrete and the filter mediums consisted of twelve inches of broken stone (passing one and one-half screen), six inches of screenings (dust removed) and twenty-four inches of sand. As was to be expected, the one and one-half acres of bed was not sufficient to treat all the sewage.

In August, 1917, one wall of the Imhoff tank gave way and soon after another engineer was retained to advise with regard to repairing the tank and what improvements in the plant should be made.

Present Treatment Plant.

The plant in operation at present consists of an Imhoff tank, siphon chamber, sprinkling filter and final settling tank. Four of the old sand filters are used for treating wastes from the woolen mills with some city sewage during three or four hours each day.

Imhoff tank—

Settling compartment=76,500 gallons=about 2 hours.

Sludge space=13,000 cubic feet=2 cubic feet per capita.

Trickling filter—

Size=150 x 87.5 x 7 = 0.3 acres.

Final settling tank—

Circular (48-foot chain) hopper, maximum depth=11½ feet.

Capacity=about 7,300 cubic feet=55,000 gallons.

Sewage—(Dry weather flow) from twenty-four-hour test fall of 1920 by consulting engineers.

Rates—Maximum (9 A. M.) 1.1 m. g. d.; minimum 2:30 A. M.=0.45 m. g. d. Average and total=650,000 gallons per twenty-four hours.

The condition of the plant on July 22nd of this year was found as follows:

(a) The depth of scum on side chambers of Imhoff tank was only about two inches. Scum is broken up twice a week with hoes and settling chamber skimmed. Sludge is drawn about every six weeks. No trouble by foaming recently.

(b) The sprinkling filters were in excellent condition.

(c) The final settling tank had a heavy scum, with considerable ebullition of gas. The pump for removing sludge had been ordered but not yet set up.

(d) Sand filter clogged and untreated sewage and wastes escaping into stream. Consequently, stream below plant was discolored.

(NOTE.—During coming year experiments will be made to determine best method of treating woolen mill wastes.)

The cost of the old works was about $26,500.00, and the new plant $30,000, making a total to date of $56,500.00 or $8.00 per capita.

Laboratory Report for the Year Ending September 30, 1921

AUBREY H. STRAUS, *Bacteriologist.*

There have been no important changes in the personnel of the laboratory during the past year. The trained staff has remained unchanged except for the addition of one technician.

As shown in Table I the work has continued to increase in both scope and volume, though this increase is not so marked as last year.

QUARTERS.

The laboratory is still situated, as it has been for the last two years, at the Medical College of Virginia. We have, however, outgrown our quarters and are at present seriously handicapped in our work by lack of space, even though we have acquired some additional space during the last year. There is no more room available in our present location. Therefore, if the laboratory is to continue to meet the calls made upon it, a change of location simply must be made in the near future.

RABIES.

Last year we expressed the opinion that rabies was increasing in the State, but we had no figures available. During the past year we have kept records of all treatments sent out through the State Board of Health, but we have no data by which we can make comparisons with previous years. The number of positive dog's heads, however, decreased from thirty-six in 1919-20 to twenty-eight in 1920-21.

The recommendation in our last annual report that the administering of Pasteur treatments by the laboratory be discontinued was adopted by the State Board of Health. This policy went into effect January 1, 1921, so that only six treatments were given by the laboratory during the past fiscal year. In addition to these forty-six treatments were sent out for administration by physicians. The cost of such treatments under the State dog law are paid for by the county dog funds and this method of handling the situation has proven entirely satisfactory. Patients are saved the trouble and expense of coming to Richmond for three weeks that they may be treated, while the laboratory is saved much time, which can be more effectively used in other directions.

DYSENTERY.

About the middle of June reports were received indicating the presence of severe dysentery in Carroll county. The bacteriologist was sent out with laboratory equipment and spent several days at the scene of the trouble making both stool and blood examinations. All of the cases studied, which included several suspected of being typhoid fever, proved to be baciliary dysentery of the Shiga type. The macroscopic agglutination test proved particularly valuable in establishing the nature of this infection.

There was no definite epidemic of dysentery due to a specific cause. The infection was scattered over considerable territory and apparently spread by contact, direct and indirect, due to a general lack of sanitation. Many of the cases were very severe and a number of deaths resulted.

TYPHOID FEVER.

Following our previous policy we have urged at every opportunity the discontinuance of the Widal test as carried out with a dried drop of blood. We also provide an outfit, similar to our Wassermann outfit, for submitting blood in sufficient quantity for macroscopic agglutination. While there has been no great call for these as yet, we are nevertheless hopeful that the dried drop method may eventually be abolished.

The use of the blood culture is increasing but not as rapidly as we had hoped. There were thirty-one blood cultures examined last year and fifty-two this year. As the physicians, however, come to realize the value of this test, we expect the number to increase rapidly.

In addition to the laboratory work, the bacteriologist aided in the investigation of several small outbreaks of typhoid fever.

WASSERMANN TEST.

While the number of these tests has continued to increase, this increase was not so great as reported last year. We do not anticipate any further sudden increase in this work, but only a gradual building up. It is quite possible, that with the survey of the State institutions completed, the next year may show a decrease in the total number of Wassermann tests made, even though the actual number submitted by physicians is larger.

As shown in the table in the report of the bureau of venereal diseases, 4,240 Wassermann tests were made for the various State institutions. The fact that 679 of these were positive more than justifies the work. It is interesting to note that while five per cent of all bloods submitted from all sources were unsatisfactory only 0.8 per cent of those coming from the State institutions were. It is also remarkable that one of the State reformatories had only one positive specimen out of 158 or 0.6 per cent. This is of particular interest as we use a cholesterinized antigen entirely and some are inclined to regard this as rather too sensitive for routine work.

WATER.

Due to the increased activity of the engineering department the number of bacteriological water examinations has materially increased. Instead of having the chemical examinations made outside as heretofore, these examinations are now made in the laboratory by our own staff. This change was made because we believe it will eventually enable us to give much better service in this direction. At present we are seriously handicapped by lack of space and insufficient equipment to handle several specimens at the same time. This makes the work unnecessarily time consuming and laborious.

GENERAL.

There was organized during the past year the "Conference of Laboratory Directors of the Southern States." The meeting was held in Atlanta, March 18th to 19th. The objects of this conference are different from the national organizations, the matters of discussion being essentially practical problems such as we encounter in our regular work. The principal discussion at this first conference considered the scope of work which a State laboratory should undertake. It is gratifying to us to find that we do practically all of those things which it was felt should be undertaken by a State public health laboratory. All realized, however, that this scope must be enlarged from time to time.

The laboratory was also represented on the program of the Society of American Bacteriologists. This paper on the "Practical Laboratory Diagnosis of Typhoid Fever" was subsequently published in the Journal of the A. P. H. A.

It is to be regretted that no investigations of real consequence can be reported, though we have studied certain practical problems as they have arisen. Until larger quarters are obtained, however, and our staff somewhat augmented, we cannot hope to accomplish much in this direction.

We have realized for two years now that a single laboratory can never serve satisfactorily the large territory covered by the State of Virginia. The cities of the State are able to maintain their own laboratories, but the rural sections and small towns must remain dependent upon the State. If the State is to serve adequately these sections, we must plan to locate branches in those parts of the State least accessible to Richmond. As soon as the present laboratory is established in proper permanent quarters, with facilities for training assistants, the establishment of branches should be undertaken. With proper local support the cost to the State of this undertaking need not be great, certainly not in proportion to the good which would be accomplished.

Respectfully submitted,

AUBREY H. STRAUS,
Bacteriologist.

TABLE I.

Showing Summary of Work Done in Laboratory by Years, for the Last 10 *Years.*

	Oct. 1, 1911 to Sept. 30, 1912	Oct. 1, 1912 to Sept. 30, 1913	Oct. 1, 1913 to Sept. 30, 1914	Oct. 1, 1914 to Sept. 30, 1915	Oct. 1, 1915 to Sept. 30, 1916	Oct. 1, 1916 to Sept. 30, 1917	Oct. 1, 1917 to Sept. 30, 1918	Oct. 1, 1918 to Sept. 30, 1919	Oct. 1, 1919 to Sept. 30, 1920	Oct. 1, 1920 to Sept. 30, 1921
Tuberculosis	1,796	2,110	2,209	2,102	2,071	1,911	1,588	1,169	1,320	1,293
Diphtheria	1,592	1,296	2,367	2,032	3,638	2,645	1,950	624	1,591	2,063
Typhoid:										
Widal	1,938	1,768	1,486	1,416	1,657	1,382	955	982	825	899
Blood culture	......	......	......	......	......	......	......	......	31	52
Feces	......	......	......	......	......	......	......	......	......	*26
Malaria	......	......	......	......	......	*703	195	113	337	234
Gonorrhea	......	......	......	......	......	......	......	......	*537	319
Wassermann	......	......	......	......	......	......	267	2,323	9,308	11,046
Rabies	......	......	......	......	......	......	......	......	82	83
Total	5,326	5,174	6,062	5,550	7,366	6,641	4,955	5,211	14,031	16,015
Miscellaneous	1,320	166	178	183	449	57	87	109	55	26
Intestinal parasites	6,722	8,366	10,262	9,029	2,833	2,290	1,264	1,812	2,239	1,148
Total diagnostic	13,368	13,706	16,502	14,762	10,648	8,988	6,306	7,132	16,325	17,189
Water:										
Bacteriological	**	882	1,186	1,172	1,508	1,284	818	1,158	1,800	2,767
Chemical	402	......	......	......	......	......	......	14	36	44
Total examinations	13,770	14,588	17,688	15,934	12,156	10,272	7,124	8,304	18,161	20,000

*Previously included with miscellaneous.
**Chemical and bacteriological samples not separated in the annual reports.

TABLE II.

Summary of Bacteriological Work Showing by Months the Number of Specimens of Each Kind Examined.

							Typhoid						Water		
1920	Diphtheria	Gonorrhea	Intestinal Parasites	Malaria	Rabies	Tuberculosis	Blood Culture	Widal	Feces	Wassermann	Miscellaneous	Total Diagnostic	Bacteria	Chemical	Total Exams.
October	531	40	79	20	5	68	5	70	....	622	1	1,441	167	15	1,623
November	475	30	39	7	6	82	3	30	....	732	1	1,405	109	8	1,522
December	268	48	86	8	9	74	1	39	....	1,074	3	1,610	96	2	1,708
1921															
January	199	19	42	2	7	109	2	34	....	1,138	....	1,552	115	....	1,667
February	114	19	159	8	4	112	....	21	....	890	1	1,328	121	3	1,452
March	55	30	86	8	5	117	3	39	2	1,367	4	1,716	261	....	1,977
April	48	19	55	20	7	93	3	40	2	899	1	1,187	230	....	1,417
May	36	31	142	14	5	100	3	46	....	1,070	2	1,449	265	2	1,716
June	42	27	66	33	16	137	9	101	10	820	5	1,266	324	1	1,591
July	57	20	161	34	10	120	3	195	1	897	2	1,500	366	....	1,866
August	122	12	163	51	4	153	12	172	11	811	4	1,515	371	5	1,891
September	116	24	70	29	5	128	8	112	....	726	2	1,220	342	8	1,570
Total	2,063	319	1,148	234	83	1,293	52	899	26	11,046	26	17,189	2,767	44	20,000

TABLE III.

Table of Diagnostic Tests Showing Results of Tests and Per Cent of Positives.

							Typhoid					
RESULT	Diphtheria	Gonorrhea	Intestinal Parasites	Malaria	Rabies	Tuberculosis	Blood Cultures	Widal	Feces	Wassermann	Miscellaneous	Total
Positive	411	61	196	4	28	253	18	162	5	2,183	......	3,321
Negative	1,416	237	935	200	47	1,031	29	662	21	8,292	......	12,870
Total positive and negative	1,827	298	1,131	204	75	1,284	47	824	26	10,475	......	16,191
*Percent positive	22	20	17	2	37	20	38	20	20	21	......	21
Atypical	15	3	......	......	......	......	......	69	......	......	......	87
Specimen unsatisfactory	221	18	17	30	8	9	5	6	......	571	......	885
Percent unsatisfactory	11	6	1.5	13	10	7	10	7	......	5	......	5
Total	2,063	319	1,148	234	83	1,293	52	899	26	11,046	26	17,189

*The percent of positives is based on the total number of positive and negative examinations.

TABLE IV.

Showing the Date, Location and Species of All Heads Found Positive for Rabies.

DATE	SPECIES	LOCATION
October 1st	Dog	Columbia, Fluvanna county.
October 7th	Dog	Schulyer, Nelson county.
October 26th	Dog	Richmond.
November 4th	Dog	Kenbridge, Lunenburg county.
November 5th	Dog	Lawrenceville, Brunswick county.
November 6th	Dog	Richmond.
November 15th	Dog	Hopewell, Prince George county.
November 26th	Dog	Stony Creek, Sussex county.
December 4th	Dog	Hopewell, Prince George county.
December 7th	Hog	Point Eastern, Caroline county.
December 8th	Dog	Richmond.
December 13th	Dog	DeWitt, Dinwiddie county.
December 20th	Dog	Hopewell, Prince George county.
December 20th	Dog	Hopewell, Prince George county.
January 6th	Dog	Hopewell, Prince George county.
January 15th	Dog	Hopewell, Prince George county.
February 2nd	Cow	Singer Glenn, Rockingham county
March 30th	Dog	Petersburg.
March 30th	Dog	Petersburg.
May 24th	Dog	Emporia, Greensville county.
June 3rd	Dog	Norfolk.
June 25th	Dog	Petersburg.
June 27th	Dog	Drewry'sBluff,Chesterfield county
August 1st	Dog	Norfolk.
August 4th	Dog	Richmond
August 13th	Dog	South Norfolk.
August 31st	Dog	Suffolk.
September 23rd	Dog	Beach, Chesterfield county.

TABLE V.

*Showing Number of Outfits Supplied to Physicians.**

Tuberculosis	1,854
Diphtheria	2,261
Widal, malaria and gonorrhea	1,705
Blood cultures	39
Wassermann	7,270
Intestinal parasites	1,444
Bacteriolcgical water samples	2,700
Total	17,273

*These figures are from the best records available but are not complete.

Report of Resident Physician, Catawba Sanatorium

CATAWBA SANATORIUM, VA., *October* 1, 1921.

Herewith is report of the medical administration of Catawba Sanatorium for the twelve months, October 1, 1920, to September 30, 1921, inclusive.

During this period 582 patients were discharged from the sanatorium after receiving treatment here. Eight patients were classed as non-tuberculous; twenty-six as doubtful; and one as tuberculous pleurisy, making a total of thirty-five which were *not* classed as having pulmonary tuberculosis; leaving a total of 547 which were classed as having pulmonary tuberculosis. Inspection of the findings on admittance and discharge shows that 417 of these 547 patients (classed as tuberculous) were improved in some degree as a result of their sanatorium experience.

Tuberculosis patients are classified, under the methods adopted by the National Tuberculosis Association, as incipient (minimal), moderately advanced, and far advanced. Applying this method of classification, it is found that:

One hundred and thirteen patients, incipient (minimal) class, showed 95.58 per cent improved under sanatorium treatment. Only five first-stage patients failed to improve. One hundred and eight patients of this class responded favorably.

One hundred and thirty-two patients were classified moderately advanced. Of these, 115, or 87.12 per cent. improved; and 17, or 12.88 per cent, failed to improve.

Three hundred and two patients were far advanced when they were admitted. Of these, 194, or 64.24 per cent, improved; and 108, or 35.76 per cent, were not improved. Eighteen, who were classed as tuberculous, and one as non-tuberculous, died during sanatorium residence.

Inspection of the appended tables will show more farmers among the patients than any other vocation represented. The geographical distribution of patients is State-wide: from Norfolk to Bristol, and from Danville to Alexandria.

May I suggest, to those who ask what physical benefits patients receive in State tuberculosis sanatoria, that 417 out of 547 patients (classed as tuberculous), or 76.23 per cent, were improved during their sanatorium residence.

With reference to the economic value of the State sanatoria for treatment of tuberculosis, may I say that up to September 30th of the present year, former patients of Catawba have reported for the year of 1920, earnings amounting $508,000.00. These earnings have been reported by about 520 former patients; the aggregate for the year will be considerably more than three-quarters of a million dollars, earned by Virginia citizens restored to working capacity by treatment received at Catawba.

Annual earnings reported by former patients of this institution for the period 1915-1920 follow:

1915	$194,772 00
1916	222,926 28
1917	400,000 00

1918	$600,000 00
1919	600,000 00*
1920	508,000 00

The educational value of State sanatoria for treatment of tuberculosis is intangible. It cannot be reduced to terms of dollars and cents, as can the earning capacity of patients physically benefited by sanatorium treatment. But in the education of its patients and in the influence for public health exercised by its discharged patients, there is a very important phase of sanatorium work. It is, perhaps, no exaggeration to say that a majority of patients learn during their sanatorium residence more about the right way to live than in all their experience before. Any mention of the value of institutions such as Catawba must properly include, in addition to an estimate of economic returns from earnings of former patients and the direct physical benefits derived by patients, a third factor; namely, the educational value to the State at large in the spread of information on public health.

It gives me pleasure to advise you that the Tuberculosis Foundation of Virginia, organized last year and described in the annual report for 1920, has had a very gratifying measure of success in enlisting the support of Virginians. The foundation charter sets forth the purposes of the incorporation as follows: (1) To establish a fund to provide for indigent consumptives; (2) to do research work, looking to the eradication, treatment, and cure of tuberculosis in Virginia, and to do all things generally to these ends.

Under the foundation plan, all funds entrusted to the organization are invested, only the interest from the investment being used; the principal once invested, remaining at interest in perpetuity for the purpose of the organization.

The last annual report of the resident physician showed the foundation had received from all sources less than $3,000. Since then contributions have been received bringing the total fund to a sum exceeding $10,000; with a bequest, in addition, amounting to $5,000. With the interest now available two patients who would otherwise be unable to continue treatment are being kept at Catawba, and two charity patients will be constantly provided for from this source.

In February of the present year the pavilion of the State Teachers' Association, made possible by the action of the legislature in appropriating $10,000 to supplement an equal sum from the Teachers' Association, was accepted from the builders. Sixteen patients are being cared for in this building, which is of brick, and attractively designed.

The connecting link between the Brown and Brewer wards has been completed, affording office and operating room space for infirmary requirements. This new construction, also released for patients' additional beds, brings the sanatorium capacity to 300.

From the Nurses' Training School there were five graduates this year: Misses Lucille Effinger, Ethel Cobb, Louise Turner, Bertha Cleaton and Leafe Beane. Diplomas were presented by Dr. Roy K. Flannagan, assistant health commissioner.

---

* Interruption of statistical work on annual letter makes figures for 1919 lower than a more complete report would show.

During the year the usual sanatorium activities have continued: Regular lectures to the patients; Sunday school in the chapel; services conducted by more or less regular visitors from city pulpits; motion pictures in the dining hall, and patient-organized parties and bazaars for the free-bed fund.

Sanatoria throughout the country continue to give some degree of attention to what is termed occupational therapy, with the idea that useful occupation of the patients' time has a beneficial effect. Some of our patients have taken up basketry, doing considerable reed and raffia work, and at times finding a sale for their handiwork. Basket-making was introduced by Doctor Taliaferro, who personally instructed the first patients undertaking the work. Interest has developed from this beginning to such a degree that more attention to basket-making and other suitable occupations would now seem indicated. A work shop where basket-making, leather work, light cabinet making, and activities within the physical capabilities of our patients is recommended. This work, without proper direction, will be somewhat ineffectual; therefore, a salaried director of occupational therapy will be necessary to secure the greatest success in this direction. It is, perhaps, not too much to plan for training of such character that patients might learn an occupation enabling them to earn a living, when otherwise they might be dependent upon others.

The resident physician in his annual report for last year to the Health Commissioner recommended a ward for children. He then said: "There is need for a ward to be used exclusively for children. It is demoralizing to children to be associated in wards with adults. Much better results are possible when children are segregated for treatment."

The recommendation is renewed. Additional experience furnishes additional proof of the objectionable results attendant upon and consequent to the association of children with patients on wards for adults.

The new dining-room and kitchen have been recommended as badly needed for several years. They are more sorely needed now than ever before. With 300 patients, we use a dining-room built when the sanatorium had a capacity of 110 patients. It is hoped that the necessary funds will be appropriated to complete the building now under construction, thereby relieving this overcrowded condition.

Every addition built at Catawba in years has been for the accommodation of more patients. More beds for patients have been installed each time. There has been no additional provision for quarters to house the medical and nursing staff, which obviously must be numerically increased as the number of patients is increased.

More quarters for employees are needed. It has been extremely difficult to find suitable men for vacancies on the medical staff at salaries offered heretofore. One obstacle, affecting particularly married men who have been considered for these positions, has been lack of quarters. Two cottages to be occupied as quarters by members of the medical staff, are earnestly recommended.

A nurses' home is one of the urgent needs, which has been passed over in earlier years in order to answer the demand for more patients' beds, and it is hoped that a nurses' home may be authorized this year.

An appropriation is requested for the purchase of additional X-ray and laboratory equipment, repuired to give Catawba modern apparatus for these important departments.

Dr. W. E. Brown, first assistant physician, resigned in the spring to take up the work of clinician for the State Board of Health, and has since been appointed superintendant of Blue Ridge Sanatorium.

Dr. B. L. Taliaferro, resident physician at Catawba, worked with his usual energy through the past winter and spring with a numerically inadequate force of assistants—at times with only one assistant—and in July had to give up and go to bed for rest which he should have taken months earlier, but which he postponed because there was no available help in the emergency.

The undersigned has served as acting resident physician since August 1st. Dr. E. C. Harper, of the State Board of Health anti-malaria force, has accepted appointment to the medical staff; Dr. F. G. Anderson, whose help has always been given in emergencies, has consented to work with us again for a time; and Dr. S. E. Lee and Dr. Edward Bancroft have recently been added to our staff.

Respectfully submitted,

J. B. NICHOLLS,
Acting Resident Physician.

TABLE I.

Class A—Patients Who Remained Less Than Three Months.

CONDITION ON ADMISSION	Result on Discharge.								
	Number or %	Doubtfull	Non-T. B.	Arrested	Apparently Arrested	Quiescent	Improved	Unimproved	Died
Non-T. B.	5 or 2.6 %	......	5	......	......	......	......	......	......
Doubtful	21 or 8.67%	21	......	......	......	......	......	......	......
Incipient (minimal)	57 or 23.55%	......	......	......	3	14	38	2	......
Moderately advanced	54 or 22.31%	......	......	......	1	9	34	10	......
Far advanced	104 or 42.97%	......	......	......	......	6	47	43	8
Not diagnosed	1 or .34%	1	......	......	......	......	......	......	......
Total	242 or 99.90%	22	5	......	4	29	119	55	8

Average length of Sanatorium residence for those who remained less than three months......48.84 days.

TABLE II.

Class B—Patients Who Remained Three Months or More.

CONDITION ON ADMISSION	Result on Discharge.								
	Number or %	Non-T. B.	Doubtful	Arrested	Apparently Arrested	Quiescent	Improved	Unimproved	Died
Non-T. B.	3 or .88%	2							1
Doubtful	4 or 1.17%		4						
Incipient (minimal)	56 or 16.47%			3	16	22	12	3	
Moderately advanced	78 or 22.94%				6	38	27	7	
Far advanced	198 or 58.23%				3	37	101	47	10
T. B. Pleurisy	1 or .29%			1					
Total	340 or 99.98%	2	4	4	25	97	140	57	11

Average length of Sanatorium residence for those who remained three months or more......203.09 days.

TABLE III.

Class A and B Continued—582 Patients Discharged During the Last Twelve Months.

CONDITION ON ADMISSION	Result on Discharge.								
	Number or %	Doubtful	Non-T. B.	Arrested	Apparently Arrested	Quiescent	Improved	Unimproved	Died
Non-T. B.	8 or 1.37%		7						1
Doubtful	26 or 4.47%	26							
Incipient (minimal)	112 or 19.42%			3	19	36	50	5	
Mod. advanced	132 or 22.68%				7	47	61	17	
Far advanced	302 or 51.89%				3	43	148	90	18
T. B. Pleurisy	1 or .17%			1					
Total	582 or 100.00%	26	7	4	29	126	259	112	19

No. Cases	Class	
113	Incipient (Min.)	Of these 113 there were imporved 108 or 95.58%; **unimproved**, 5 or 4.42%
132	Moderately adv	Of these 132 there were **improved** 115 or 87.12%; **unimproved**, 17 or 12.88%
302	Far advanced	Of these 302 there were **improved** 194 or 64.24%; **unimproved**, 108 or 35.76%
547		Of these 547 there were **improved** 417 or 76.23%; **unimproved**, 130 or 23.77%

REPORT FOR TWELVE MONTHS, ENDING SEPTEMBER 30, 1921.

Number of patients treated during last twelve months	887
Number of patients in sanatorium September 30, 1921	305
Number of patients discharged during last twelve months	582

Arrested	4 or	.60%
Apparently arrested	29 or	4.98%
Quiescent	126 or	21.64%
Improved	259 or	44.50%
Unimproved	112 or	19.24%
Died	19 or	3.26%
Non-T. B.	7 or	1.20%
Doubtful	26 or	4.46%
Total	582 or	99.88%

Average duration of sanatorium residence in days	138.95 days
Total number of hospital days	80,873

NUMBER OF PATIENTS FROM THE DIFFERENT COUNTIES OF VIRGINIA

For Twelve Months, Ending September 30, 1921.

1. Accomac	7
2. Albemarle	1
3. Arlington	9
4. Alleghany	14
5. Amelia	2
6. Amherst	4
7. Appomattox	0
8. Augusta	8
9. Bath	1
10. Bedford	11
11. Bland	0
12. Botetourt	3
13. Brunswick	3
14. Buchanan	1
15. Buckingham	1
16. Campbell	22
17. Caroline	1
18. Carroll	5
19. Charles City	0
20. Charlotte	2
21. Chesterfield	1
22. Clark	2
23. Craig	0
24. Culpeper	2
25. Cumberland	1
26. Dickenson	0
27. Dinwiddie	20
28. Elizabeth City	3
29. Essex	0
30. Fairfax	2
31. Fauquier	0
32. Floyd	2
33. Fluvanna	1
34. Franklin	4
35. Frederick	11
36. Giles	4
37. Gloucester	3
38. Goochland	0
39. Grayson	3
40. Greene	0
41. Greenesville	1
42. Halifax	3
43. Hanover	4
44. Henrico	68
45. Henry	5
46. Highland	0
47. Isle of Wight	3
48. James City	1
49. King and Queen	0
50. King George	1
51. King William	1
52. Lancaster	0
53. Lee	0
54. Loudoun	1
55. Louisa	2
56. Lunenburg	3
57. Madison	0
58. Mathews	3
59. Mecklenburg	9
60. Middlesex	2
61. Montgomery	11
62. Nansemond	14
63. Nelson	2
64. New Kent	1
65. Norfolk	87
66. Northampton	3
67. Northumberland	0
68. Nottoway	4
69. Orange	0
70. Page	1
71. Patrick	9
72. Pittsylvania	17
73. Powhatan	0
74. Prince Edward	2
75. Prince George	1
76. Princess Anne	7
77. Prince William	2
78. Pulaski	4
79. Rappahannock	0
80. Richmond	2
81. Roanoke	44
82. Rockbridge	4
83. Rockingham	4
84. Russell	4
85. Scott	4
86. Shenandoah	4
87. Smyth	12
88. Southampton	5
89. Spotsylvania	1
90. Stafford	1
91. Surrey	1
92. Sussex	0
93. Tazewell	15
94. Warren	3
95. Warwick	18
96. Washington	20
97. Westmoreland	0
98. Wise	10
99. Wythe	4
100. York	0

LIST OF PATIENTS FROM THE INDEPENDENT CITIES OF VIRGINIA.

Alexandria	8
Bristol	5
Buena Vista	0
Charlottesville	1
Clifton Forge	0
Danville	10
Fredericksburg	0
Harrisonburg	3
Lynchburg	13
Newport News	18
Norfolk	72
Petersburg	17
Portsmouth	10
Radford	1
Richmond	69
Roanoke	36
Suffolk	8
Winchester	10

OCCUPATIONS OF PATIENTS IN SANATORIUM.

For Twelve Months, Ending September 30, 1921.

1. Architect	1
2. Auto mechanic	9
3. Asst. window dresser.	1
4. Bank clerk	2
5. Barber	3
6. Blacksmith	1
7. Bookkeeper	5
8. Brick mason	4
9. Butcher	1
10. Candy maker	1
11. Carpenter	4
12. Car repairer	1
13. Cashier	2
14. Clerk	37
15. Construction	1
16. Contractor	4
17. Dairyman	1
18. Deputy clerk	1
19. Deputy sergeant	1
20. Draftsman	1
21. Drug clerk	2
22. Electrician	4
23. Engineer	3
24. Engineer, civil	1
25. Engineer, railroad	1
26. Engineer, Marine	2
27. Factory	8
28. Farmer	63
29. Fisherman	2
30. Foreman	2
31. Government clerk	1
32. Grocery clerk	2
33. Housework	187
34. Inspector	1
35. Insurance	5
36. Iron worker	1
37. Jeweler	1
38. Laborer	6
39. Linesman	3
40. Lumber dealer	1
41. Linotype operator	1
42. Machinist	13
43. Mail carrier	1
44. Meat packer	1
45. Mechanic	3
46. Merchant	12
47. Miller	2
48. Milliner	1
49. Miner, coal	1
50. Motorman	3
51. Molder	2
52. Nothing	
53. Nurse	17
54. Painter	5
55. Pharmacist	2
56. Photographer	1
57. Physician	1
58. Plumber	5
59. Plasterer	1
60. Post mistress	1
61. Printing	2
62. Purchasing agent	1
63. Railroad brakeman	3
64. Railroad clerk	4
65. Railroad conductor	1
66. Railroad fireman	1
67. Railroad flagman	1
68. Railroad ticket agent.	1
69. Resturant	2
70. Salesman	18
71. Salesman, traveling	3
72. Saleswomen	2
73. Seamstress	2
74. Shipyard employee	2
75. Signalman	1
76. Stenographer	11
77. Store manager	1
78. Student	28
79. Street car conductor	2
80. Stone mason	1
81. Supervisor	1
82. Switchman	1
83. Taxi driver	1
84. Tobacco dealer	1
85. Tailor	1
86. Teacher	16
87. Telegrapher	1
88. Telephone operator	2
89. Timekeeper	1
90. Truck driver	1
91. Truck maker	1
92. Trunk maker	1
93. Upholsterer	1
94. Waitress	2

Report of Business Manager of Catawba Sanatorium

Herewith is a report of maintenance and operation of this institution for the fiscal year ending September 30, 1921:

You will note that the average number of patients cared for during this period was 285.64, at a cost of $1.903 per day, or $13.32 per week, as against a cost of $1.936 per day, or $13.55 per week, for the year ending September 30, 1920.

I have received from Dr. Glidden, of the Georgia State Sanatorium, a compilation of the per capita food costs and per capita total costs of forty-one tuberculosis institutions, which shows the average maintenance cost to be $2.51 per day, or $17.57 per week. The highest total per capita cost seems to be at Forester State Sanatorium, California, $3.57 per day, or $24.99 per week. The lowest is Pine Breeze, Tenn., $1.67 per day, or $11.69 per week. The average raw food cost of twenty-six of these institutions is .832 per day, the highest being shown at Shelton State, Connecticut, $1.18, and the lowest at Blue Grass, Ky., 48 cents. Our raw food cost for the year ending September 30th is .8032.

I am glad to say that the farm is being improved gradually each year, and has turned over to the sanatorium during the fiscal year ending September 30, 1921, milk, vegetables, pork, etc., in the amount of $18,939.66. We have just about completed the feeding barn, for which we had an appropriation of $7,000.00 by the last legislature. This will help us wonderfully in caring for our cattle during the coming winter.

I am also attaching report covering the following special appropriations, made prior to the legislature of 1920:

For X-ray equipment; showing a balance of	$ 635 98
For repairing roofs, new floors and painting pavilions; showing a balance of	1,285 17
Equipment for additional beds; showing a balance of	29 77
For spur track and coal bins; showing a balance of	1,002 50

In addition to these special appropriations, I am including in my statement of special accounts that covering the appropriations for the teachers' pavilion, and also the account known as United States Public Health patients' account, which shows a balance of $9,352.00.

Since making my last annual report, I am glad to report the completion of the service building and nurses' home, which is a three-story structure connecting the two wings of the one hundred-bed infirmary. The first floor, central portion, will be used as a reception room, with an office on one side and examining room on the other. The second floor consists of a temporary diet kitchen, nurses' office, operating room, throat and examining room. The third floor, with five rooms and large living room, solves to some extent the problem of housing the nurses. The appropriation made by the last legislature for this building was $27,500.00. The actual cost of the building was $33,870.04, the difference of $6,620.04 being taken from United States Public Health patients' account.

The teachers' pavilion was opened on February 12, 1921. An appropriation of $10,000.00 was made by the last legislature for this purpose, and an equal amount, $10,000.00, was appropriated by the State Teachers' Association. The construction of this building is brick, with a solid concrete foundation and a tin roof. The cost of the building, complete with heat, furnishings, etc., was $20,000.00.

The appropriation of $13,000.00 by the last legislature for additions to the central heating plant, resulted in the heating of the teachers' pavilion, office, home cottage, hotel, Baker pavilion and nurses' cottage. In order to complete this work it was found necessary to use $1,207.54 from the United States Public Health patients' account, making the total cost $14,207.54.

Contract for the pumphouse and the installation of filtration plant was let some months ago to Sears & Brown, of Salem, together with contract for the erection of the feeding barn and dining room—kitchen building, both of which are now under construction. All material and equipment are on the ground and we expect to commence this work as soon as possible.

Respectfully submitted,

A. LAMBERT MARTIN,
Business Manager.

STATEMENT OF COST.

MAINTENANCE AND OPERATION.

For Year Ending September 30, 1921.

Administration:			
Salaries			$ 5,010 00
Traveling			314 21
Communications		$ 886 31	
Less ledger credit		74 15	
			812 16
Office supplies			269 20
Administration—Capital outlay:			
Office equipment		($96 75)	
Operation of hospital:			
Salaries			55,872 44
General repairs			981 99
Motor vehicle repairs			1,792 67
Light and power		$ 1,980 32	
Less ledger credit		70 00	
			1,910 32
Traveling			1,718 58
Other expenses			8 25
Food supplies:			
Inventory September 30, 1920		$ 4,437 26	
Purchases		68,005 78	
Total		$ 72,443 04	
Less ledger credit	$ 178 78		
Less cash sales	2,765 12		
Less cash collections (transients' board)	4,222 62		

Statement of Cost—CONTINUED.

Less inventory September 30, 1921	$ 2,725 57		
		$ 9,892 09	
			$ 62,550 95
Fuel supplies:			
Inventory September 30, 1920		$ 00 00	
Purchases		9,412 90	
Total		$ 9,412 90	
Less ledger credit	$ 331 89		
Less inventory September 30, 1921	2,700 00		
		3,031 89	
			6,381 01
Medical and laboratory supplies:			
Inventory September 30, 1920		$ 1,432 94	
Purchases		9,900 44	
Total		$ 11,333 38	
Less ledger credit	$ 75 00		
Less cash sales	610 50		
Less cash collections (X-ray)	4,044 50		
Less inventory September 30, 1921	1,400 10		
		6,130 10	
			5,203 28
Laundry, cleaning and disinfecting supplies:			
Inventory September 30, 1920		$ 322 57	
Purchases		1,462 60	
Total		$ 1,785 17	
Less inventory September 30, 1921		304 09	
			1,481 08
Refrigerating supplies		$ 690 49	
Less ledger credit		45 00	
			645 49
Motor vehicle supplies		$ 3,116 57	
Less ledger credit		6 15	
			3,110 42
Other supplies		$ 140 31	
Less ledger credit		3 76	
			136 55
Special payments			267 10
Transportation		$ 13,119 46	
Less cash collections (patients and transients)	$ 2,993 60		
Less express collections (patients)	225 22		
Less freight on unused coal September 30, 1921	2,268 00		
		5,486 82	
			7,632 64
Other materials			927 85
Office supplies			239 21
Communications		$ 812 26	
Less cash collections—Telegrams	$ 195 06		
Less cash collections—Telephone	79 00		
		274 06	
			538 20
Refund board		($2,767 11)	
Household equipment		8,342 68	
Less ledger credit		299 16	
			8,043 52

Statement of Cost—CONTINUED.

Printing:			
Inventory September 30, 1920		$ 175 00	
Purchases		939 42	
Total		$ 1,114 42	
Less ledger credit	$ 120 85		
Less inventory September 30, 1921	150 00		
		270 85	
			$ 843 57
Laundry			3,641 51
Educational and recreational supplies		$ 168 53	
Less ledger credit		79 25	
			89 28
Wearing apparel		$ 292 68	
Less ledger credit		22 35	
			270 33
Operation of hospital—Capital outlay		$ 5,134 46	
Less ledger credit		125 00	
		($5,009 46)	
Construction and maintenance of buildings and grounds:			
Salaries			4,279 51
Sewer and water materials		1,406 75	
Less ledger credit		20 00	
			1,386 75
Agricultural and botanical supplies			62 05
Building materials		$ 2,474 62	
Less ledger credit		79	
			2,473 83
Other materials		$ 663 04	
Less ledger credit		5 22	
			657 82
Insurance		($2,970 58)	2,000 00
Other supplies			134 37
Transportation			105 27
Construction and maintenance of buildings and grounds—Capital outlay		($27,675 40)	
Operation of farm:			
Salaries			6,427 81
General repairs			151 20
Motor vehicle repairs			155 21
Transportation			204 42
Forage and veterinary supplies:			
Inventory September 30, 1920		$ 8,000 05	
Purchases		6,876 94	
Total		$ 14,876 99	
Less cash sales	$ 1,511 52		
Less inventory September 30, 1921	6,271 52		
		7,783 04	
			7,093 95
Agricultural and botanical supplies			978 91
Other supplies			378 32
Rent		$ 276 00	
Less credit		798 71	
Net credit		($522 71)	
Operation of farm—Capital outlay		($3,765 66)	

Statement of Cost—CONTINUED.

Maintenance of convict road force:	
Salaries	$ 1,200 00
Wearing apparel	499 64
	$198,880 87
Less credit (rent)	522 71
Net expenditure for maintenance and operation	$198,358 16

With a daily average of 285.64 patients, thus showing the cost to be $1.903 per day, or $13.32 per week.

Report of Blue Ridge Sanatorium

COMMONWEALTH OF VIRGINIA

STATE BOARD OF HEALTH

BLUE RIDGE SANATORIUM

CHARLOTTESVILLE, VA., *October* 21, 1921.

I submit our annual report for the fiscal year ending September 30, 1921. During this period, 229 patients were discharged from the sanatorium, representing fifty counties, 136 of these were from sixteen of the principal cities and towns of Virginia.

The Bureau of War Risk Insurance, in not sending their cases to any institutions other than U. S. P. H. hospitals, has greatly decreased revenues from patients' board. At one time, these revenues amounted to nearly $1,000.00 per month from this cource. The sanatorium, however, is being kept full at all times and for sometime we have had a rather long waiting list, especially for women patients.

CONSTRUCTION.

Work is going along nicely on the new sixty-bed infirmary building, also on the new dining-room, which when completed will have a seating capacity of 220.

I believe that the additional beds which are being added will make this a more economical unit to administer and that we shall be able to bring down our per capita cost to a considerable extent when the present additions are completed.

As you know Dr. Walter C. Klotz resigned as medical director—effective August 1, 1921—and that in the limited time since I have been in charge, it is hard for me to form adequate estimates of what our future needs will be.

CHAPEL.

The patients seem to be very enthusiastic about the sanatorium and the work we are doing. With the able assistance of Mr. Charles E. Brauer, of Catawba Sanatorium, and Dr. Frank B. Stafford, first assistant here, they are raising funds to build a chapel. At the present time, they have $3,000 in cash and pledges for this purpose.

ROADS.

The concrete road has been completed from Charlottesville to the sanatorium gate. There is need for considerable repair on the road from the sanatorium to the gate.

SCREENS NEEDED.

Provision should be made for screening the new infirmary and dining-room.

CHILDREN'S PAVILION NEEDED.

There seems to be quite a demand throughout the State for sanatorium treatment for children. It does not seem very practicable to put children on the pavilions with adults, therefore, if we are to try to take care of these children here, there ought to be a children's pavilion.

X-RAY NEEDED.

A thoroughly up-to-date X-ray equipment is needed very much. At present, patients are having to be transported about two miles to the University hospital to have radiographs made. Frequently there are patients whose condition is such that it is not advisable for them to be carried this distance. I, therefore, respectfully urge that an appropriation be made to purchase an X-ray outfit, which can be made to maintain itself just as the one at Catawba Sanatorium is doing.

STAFF QUARTERS NEEDED.

More commodious quarters are very much needed for the medical and nursing staff.

INCREASE IN STAFF NEEDED.

In the enlargement of the sanatorium, provision should be made for employment of additional nurses and a second assistant physician. Dr. Stafford is doing splendid work as first assistant; but there is need of a second assistant to take care of the increase in size, and to be in readiness in case of sickness or for any other reason whereby the first assistant would be compelled to be off duty.

Yours very truly,

W. E. BROWN,

Superintendent and Medical Director.

NUMBER OF PATIENTS FROM THE DIFFERENT COUNTIES OF VIRGINIA

Year Ending September 30, 1921.

Albemarle	29	Halifax	1	Pittsylvania	9
Alleghany	19	Hanover	2	Princess Anne	2
Amherst	1	Henrico	38	Prince Edward	1
Arlington	11	Highland	1	Prince William	2
Augusta	15	King and Queen	2	Pulaski	1
Campbell	11	Loudoun	1	Richmond	1
Charlotte	2	Louisa	4	Roanoke	1
Chesterfield	2	Middlesex	2	Rockbridge	4
Clarke	1	Nansemond	3	Rockingham	4
Culpeper	2	Nelson	3	Shenandoah	1
Dinwiddie	5	New Kent	2	Spotsylvania	3
Fairfax	1	Norfolk	13	Warren	3
Fauquier	3	Northampton	1	Warwick	4
Fluvanna	1	Nottoway	1	Washington	1
Frederick	1	Northumberland	3	Westmoreland	1
Greene	1	Orange	6	York	1
Greenesville	1	Page	1		—
				Total	229

OCCUPATION OF PATIENTS IN SANATORIUM

Year Ending September 30, 1921.

Accountants	2	Farmers	16	Saleswomen	4
Architects	3	Firework makers	1	Salesmen	3
Barbers	2	Fishermen	1	Saw-filers	1
Baggage clerks	1	Housewives	46	Shipbuilders	1
Bakers	1	Housework	17	Shoemakers	2
Boilermakers	2	Insurance agents	1	Steamfitters	1
Bookkeepers	4	Laborers	5	Stenographers	6
Butchers	1	Machinists	3	Stone masons	1
Carpenters	2	Mechanics	5	Street car conductors	2
Cashiers	1	Merchants	1	Students	20
Chauffeurs	2	Ministers	2	Tailors	3
Cigarette makers	2	No occupation	7	Teachers	12
Clerks	17	Nurses	3	Telegraph operators	2
Commissioner of revenue.	1	Painters	3	Telephone operators	1
Cotton mill	1	Plasterers	1	Typists	1
Druggists	2	Pressmen	2	Tobacconists	1
Engineer, locomotive	3	Railroad conductors	1		—
Engineer, marine	1	Restaurant	2	Total	229
Factory workers	2	Real estate agents	1		

LIST OF PATIENTS FROM THE INDEPENDENT CITIES OF VIRGINIA.

Year Ending September 30, 1921.

1. Alexandria	10	7. Fredericksburg	0	13. Richmond	38
2. Charlottesville	17	8. Lexington	2	14. Roanoke	1
3. Clifton Forge	8	9. Lynchburg	10	15. Staunton	9
4. Covington	10	10. Newport News	3	16. Suffolk	2
5. Danville	7	11. Norfolk	12	17. Winchester	1
6. Farmville	1	12. Petersburg	5		—
				Total	136

TABLE No. I.

Class A—Patients Who Remained Less Than Three Months.

CONDITION ON ADMISSION (Number 69)	Result on Discharge							
		Non-T. B.	Arrested	Apparently Arrested	Quiescent	Improved	Unimproved	Died
Non-T. B.	2 or 2.9 %	2	....	....	....	....	....	....
Doubtful	....	....	....	....	....	....	....	....
Minimal	18 or 26.08 %		....	....	4	5	9	....
Moderately	....	....	....	....	....	....	....	....
Advanced	32 or 46.38 %	....	....	....	4	12	15	1
Far advanced	17 or 24.64 %	....	....	....	1	2	9	5
Undiagnosed	....	....	....	....	....	....	....	....
Total	69 or 100%	2	....	....	9	19	33	6

Class B—Patients Who Remained Three Months or Over.

CONDITION ON ADMISSION (Number 160)	Result on Discharge							
		Non-T. B.	Arrested	Apparently Arrested	Quiescent	Improved	Unimproved	Died
Non-T. B.	....	....	....	....	....	....	....	....
Doubtful	....	....	....	....	....	....	....	....
Minimal	34 or 21.25 %	....	2	25	5	2	....	....
Moderately	....	....	....	....	....	....	....	....
Advanced	88 or 55%	....	8	17	18	28	13	4
Far advanced	37 or 23.125%	....	....	....	2	14	14	7
Pleurisy with efflusion	1 or .625%	....	....	....	....	....	....	1
Total	160 or 100%	....	10	42	25	44	27	12

Classed A and B Combined—229 Patients Discharged During 12 Months.

CONDITION ON ADMISSION (Number 229)		Result on Discharge						
		Non-T. B.	Arrested	Apparently Arrested	Quiescent	Improved	Unimproved	Died
Non-T. B.	2 or .864%	2						
Doubtful								
Minimal	52 or 22.7 %		2	25	9	7	9	
Moderately advanced	120 or 52,4 %		8	17	22	40	28	5
Far advanced	54 or 23.58 %				3	16	23	12
Plurisy with effusion	1 or .444%							1
Undiagnosed								
Total	229 or 100%	2	10	42	34	63	60	18

No. Cases	Class	
52	Minimal	Of these 52 there were improved.......43 or 82.69%
		Of these 52 there were unimproved..... 9 or 17.31%
120	Moderately advanced	Of these 120 there were improved.......87 or 72.5 %
		Of these 120 there were unimproved....33 or 27.5 %
54	Far advanced	Of these 54 there were improved........19 or 35.18%
		Of thes 54 there were unimproved.....35 or 64.82%

TABLE No. 2.

Class A—Effects of Treatment on Prominent Symptoms—Patients Who Remained Less Than Three Months.

	On Admission	On Discharge	Previous	During Residence	Average Gain in Pounds	Average Loss in Pounds
Number of patients whose expectoration contained bacilli	32	10	15	11		
Number of patients who had no expectoration or no bacilli	37	59	54	58		
Number of patients who had hemorrhages				3		
Number of patients who had no hemorrhages				66		
Number of patients who gained weight				39	5	
Number of patients who lost weight				21		6.57
Number of patients whose weight was stationary				6		
Number of patients not weighed				3		
Number of patients who died				6		

Total number of patients reported on in this table.......69

Class B—Effects of Treatment on Prominent Symptoms—Patients Who Remained Three Months or More.

	On Admission	On Discharge	Previous	During Residence	Average Gain in Pounds	Average Loss in Pounds
Number of patients whose expectoration contained bacilli	90	43	61	63		
Number of patients who had no expectoration or no bacilli	70	117	99	97		
Number of patients who had hemorrhages				15		
Number of patients who had no hemorrhages				145		
Number of patients who gained weight				113	12.02	
Number of patients who lost weight				46		8.3
Number of patients whose weight was stationary						
Number of patients not weighed				1		
Number of patients who died				12		

Total number of patients reported on in this table.......160

CASH RECEIPTS FOR TWELVE MONTHS ENDING SEPTEMBER 30, 1921.

Balance in The National Bank, October 1, 1920		$ 1,866 28
Patients' accounts receivable		47,628 59
Transportation		160 35
State appropriation		83,250 00
Transients' board		711 17
Telegrams		41 02
Medical and laboratory supplies		327 75
Telephone		46 21
Farm sales		230 74
Groceries		70 62
Express		16 80
X-rays		583 25
Miscellaneous (interest on deposit)		338 90
Total receipts		$ 135,271 68
Total disbursements		128,706 65
Balance on hand, October 1, 1921		$ 6,565 03
As follows:		
The National Bank	$1,107 80	
Peoples National Bank (construction)	5,457 23	
	$6,565 03	
	$6,565 03	$ 6,565 03

DISBURSEMENTS FOR TWELVE MONTHS ENDING SEPTEMBER 30, 1921.

Administration:		
Salaries and wages	$ 5,548 79	
Traveling expenses	457 64	
Communications	511 26	
Printing	310 90	
Office supplies	390 80	
Total administration		$ 7,219 39
Operation of sanatorium:		
Salaries and wages	$20,636 35	
Light and power	1,652 60	
Transportation	433 35	
Food	40,382 64	
Fuel	6,268 77	
Medical and laboratory supplies	5,067 47	
Laundry, cleaning and disinfecting	3,734 90	
Other supplies	1,564 56	
Insurance	1,294 63	
Refund board	134 25	
Total for operation		81,169 52
Motor transportation:		
Motor vehicle supplies	$ 1,957 02	
Motor vehicle repairs	912 71	
Total motor transportation		2,869 73
Maintenance, buildings and grounds:		
Salaries and wages	$ 3,267 04	
Supplies and material	925 04	
Equipment and replacements	1,685 14	
Total maintenance, buildings and grounds		5,877 22
Garden and farm:		
Salaries and wages	$ 3,156 59	
Agricultural supplies	1,125 67	
Equipment replacement	344 50	
Total farm and garden		4,626 76
Board meetings		879 20
Educational		302 91
X-rays		1,075 50
Capital outlays:		
Equipment	$18,018 62	
Structures	6,668 00	
Total capital outlays		24,686 62
Total disbursements for twelve months		$128,706 65

STATEMENT OF COST, MAINTENANCE AND OPERATION.

For Twelve Months Ending September 30, 1921.

Administration:				
Salaries			$ 5,548 79	
Traveling expenses			457 64	
Communications		$511 26		
Less cash		87 23		
			424 03	
Printing		$310 90		
Less inventory, September 30, 1921		70 00		
			240 90	
Office supplies inventory, September 30, 1920		$ 6 50		
Office supplies purchased		390 80		
		$397 30		
Less inventory, September 30, 1921		85 00		
			312 30	
Total net administration				$ 6,983 66
Operation of sanatorium:				
Salaries and wages			$20,636 35	
Light and power			1,652 50	
Transportation		$ 433 65		
Less cash		177 15		
			256 50	
Insurance inventory, September 30, 1920		$ 1,150 08		
Insurance purchased		1,294 63		
		$ 2,444 71		
Less inventory, September 30, 1921		1,240 69		
			1,204 02	
Food inventory, September 30, 1920		$ 982 90		
Food purchased		40,382 64		
Food furnished from farm		2,559 47		
		$43,925 01		
Less groceries sold	$ 70 62			
Less transients' board	711 17			
Less inventory, September 30, 1921	1,518 35			
		2,300 14		
			41,624 87	
Fuel inventory, September 30, 1920		$ 2,250 00		
Fuel purchased		6,268 77		
		$ 8,518 77		
Less inventory, September 30, 1921		1,331 25		
			7,187 52	
Medical and laboratory supplies inventory, September 30, 1920		$ 365 65		
Medical and laboratory supplies purchased		5,067 47		
		$ 5,433 12		
Less cash sales	$ 327 75			
Less inventory, September 30, 1921	1,562 10			
		1,889 85		
			3,543 27	

Statement of Cost, Maintenance and Operation—CONTINUED.

Laundry and cleaning and disinfecting inventory		$ 535 25		
Laundry and cleaning and disinfecting purchased		3,734 90		
		$ 4,270 15		
Less inventory, September 30, 1921		268 00		
			$ 4,002 15	
Other supplies inventory, September 30, 1920		$ 49 31		
Other supplies purchased		1,564 56		
		$ 1,613 87		
Less inventory, September 30, 1921		143 40		
			1,470 47	
Total net operation				$ 81,577 65
Motor transportation:				
Motor supplies inventory, September 30, 1920		$ 19 66		
Motor supplies purchased		1,957 02		
Motor vehicle repairs		912 71		
		$ 2,889 39		
Less inventory, September 30, 1921		99 00		
Total net transportation				$ 2,790 39
Maintenance, buildings and grounds:				
Salaries and wages		$ 3,266 94		
Supplies and material		925 04		
Equipment		1,685 14		
Inventory, September 30, 1920		100 00		
		$ 5,977 12		
Less inventory, September 30, 1921		210 00		
Total net maintenance, buildings and grounds				5,767 12
Farm and garden:				
Inventory, September 30, 1920		$ 850 00		
Salaries and wages		3,156 59		
Agricultural supplies		1,125 57		
Equipment replacement		344 50		
		$ 5,476 66		
Less cash sales	$ 230 74			
Less inventory crop in barn	345 00			
Less growing crop	517 00			
Less inventory, hogs	655 50			
Less food furnished	2,632 55			
		4,380 79		
Net expense of farm				$ 1,095 87
Board meeting				879 20
Educational				302 91
Total expense				$ 99,396 80

Statement of Cost, Maintenance and Operation—CONTINUED.

Less salaries and other accounts paid in October, 1920, for September, 1920	$ 3,377 71
Net expense for operating sanatorium	$ 96,019 09
Total number of patient—days from September 30, 1920, to September 30, 1921	41,811 days
Thus showing the cost to be per patient—day	$2.296
Total capital outlays:	
Equipment	$18,018 62
Structures	6,668 00
Total capital outlays	$24,686 62

ESTIMATES ON MILL TAX FUND.

For repairs to heating plant		$ 5,500 00
Heating administration building		1,875 00
Digging pit at boiler room and tunnel from same to pit under infirmary		4,893 29
Changes in construction over dining-room		3,785 00
		$ 16,053 29
Less $10,000.00 allowed for extras on statement of August 17th		10,000 00
		$ 6,053 29
Total balance on contracts August 17th		109,629 06
		$115,682 35
Maintenance to January 1, 1922		23,750 00
		$139,432 35
Mill tax fund used to August 17th		76,775 50
		$216,207 85
Probable extras on new infirmary		600 00
Total		$216,807 85
Appropriation for 1921	$137,437 98	
Balance in Peoples National Bank	6,000 00	
		$143,437 98
Deficit January 1, 1922		$ 73,369 87
Appropriation estimated mill tax fund	$145,000 00	
Less deficit January 1, 1922	73,369 87	
	$ 71,630 13	
Less January and February, 1922, maintenance	8,640 00	
	$ 62,990 13	
Less educational fund	10,000 00	
Estimated balance March 1, 1922	$ 52,990 13	

Report of Piedmont Sanatorium

GENERAL COMMENTS.

Summarizing reports made to the Health Commissioner, some 720 cases of pulmonary tuberculosis have been discharged from Piedmont Sanatorium up to September 30, 1921. Of this number 204 were admitted for segregation and 516 for treatment. Of the 516 admitted for treatment, 302 or fifty-eight per cent were discharged as improved and 214 or forty-two per cent as unimproved. This is not so good a percentage as is generally reported from white sanatoria. There are many factors that bring about this result: lack of resistance on the part of the negro race; vicious habits on the part of some individuals; the negro's fear of the diagnosis of tuberculosis and consequently the avoidance of a doctor or suppression of facts when he does call on his doctor; and lastly because he cannot as a rule get the best attention or the best doctor. These latter two factors give us a greater percentage of cases in the advanced stages than are reported from the white sanatoria. I sometimes question that lack of resistance has a great effect on results, in substantiation of this statement I want to call your attention to the following facts: Of 58 cases admitted as incipient, 52 were discharged improved; of 156 cases admitted as moderately advanced, 122 were discharged improved, while of 506 cases admitted as far advanced, 111 were discharged improved. The percentage of improvements in the first and second stages compare very favorably with other sanatoria. The percentage of improvements in the third stage is much less. Again, in our follow-up work, a report on cases discharged in the first two and one-half years of operation shows one dead in thirty-eight cases admitted as incipient, or ninety-seven per cent living. Sixteen dead in ninety-five cases admitted as moderately advanced, or eighty-three per cent living. One hundred and eighty dead of 248 cases admitted as far advanced, or twenty-three per cent living. These results all serve to show the importance of early diagnosis. The propaganda carried on today through the clinics is aimed at this, the very root of all tuberculosis work.

Another weak point in sanatorium treatment is lack of proper supervision after leaving the sanatorium. Although every discharged patient is drilled in proper precautions to care for his general health only the most intelligent will put into practice for any length of time what is taught them. Some through lack of suitable employment are unable to do what is necessary to prevent future breakdown. Few employers want a laborer who is forced to rest two hours in the middle of day. This condition can be remedied by the institution of vocational training at the tuberculosis sanatoria. We can make out of a laborer a skilled electric shoe worker, for instance, thereby helping the laborer and reducing the present high cost of half-soling shoes; book-binding, chair work, poultry raising, etc., can be taught. For the colored man some form of skilled manual work should be taught every day laborer who enters a sanatorium and is discharged as improved. In this way we provide necessary skilled labor to his community and tend to prevent future breakdown by providing him with a suitable occupation. Complete this arrangement with a supervising nurse and we have the ideal for tuberculosis work.

Summarizing.—Propaganda for an early diagnosis, sanatorium treatment for the diseased in early form, local hospital care for the advanced, and the teaching of a suitable occupation with supervision for the discharged patients are all linked hand in hand. This requires quite an outlay, but if the eradication of tuberculosis is to be desired all are necessary. The leaving out of any one breaks a link in the chain and renders the whole chain—certainly less effective. Not to educate the public for an early diagnosis or to properly supervise the discharged case or to teach a suitable occupation to these needing it renders the work of the sanatorium less effective. Sanatorium treatment on the other hand is the backbone of the whole work.

SPECIAL COMMENTS.

I want to call your attention to the splendid morale and general behavior of the patients at Piedmont Sanatorium. During the three years of operation we have not had one single instance of any marked disorders among the employees or patients. No fights or disorders have ever been reported from the wards. This in spite of the fact that we have at times as high as fifty or sixty patients out to meals and twenty or thirty employees mingling with them. Patient and employees have been at all times respectful and obedient to those in charge and the handling of them is a pleasure to the staff. Is this because of the type of negro we are dealing with? We have almost entirely one of two classes, the white man's family servant or the better class and educated negro, both of these classes we find thoroughly respectful and appreciative. After all the better class and educated negro is a decendant of the picked house-servant of slavery times of whom our ancestors were so fond and with whom we are thrown so little in contact today. They are today the leaders of their people and many of them have the same qualities that endeared them to their masters and made it possible to leave their families in care of hundreds of them. They are the leaders of their people for the same reason that their ancestors were picked by their masters for the responsible positions in the household—dependability and efficiency.

THE SEGREGATED CASE.

Our purpose is to admit all cases applying for admission and if examination and a few days observation in the sanatorium shows them to be cases classed as iii-C under the classification of the National Tuberculosis Association and we feel that they will not be benefitted by treatment we notify the parties responsible that unless they can show some reason why we should keep the case for segregation we shall expect them to come for the patient at the end of the first two weeks. We consider for segeration; those who live in a one- or two-room shack with a number of children under ten years of age and for whom there is no local means of caring away from family; those with no family and no place in the community for segregation and for whom some local organization becomes responsible. Careful effort is made, however, not to allow this type of cases to exceed twenty per cent of the total number of cases admitted and in keeping this minimum percentage some possibly deserving cases are necessarily excluded. If a sanatorium is to be maintained for the treatment of pulmonary tuberculosis it is essential that the number of hopelessly sick in close proximity to the early case be limited; otherwise the depressing effect upon the treatable case would defeat our purpose. Rather than remain in the depressing atmosphere and take the prolonged rest needed to effect a cure he will leave the sanatorium and return to the conditions under which he "was going under" only to become himself one of these cases for segregation in a few months or years. It is this hopelessly sick case of tuberculosis that appeals to welfare workers, going into a home and seeing a hopelessly sick person under the most unsanitary conditions appeals very strongly to the sympathy of one interested in the welfare of humanity. He or she does not stop to take in consideration the fact that the patient can live but a few months at best and to take him out of his home environment, especially to send him on a long railroad journey, will very naturally shorten those months even should he be made physically more comfortable. From the "source of danger" standpoint he has probably infected by this time all those with whom he has come into intimate contact, his own family and that of his employers if he happens to be a laborer. The ideal way to handle this type of case is through local hospitals, in the absence of those it is the exceptional case that cannot be made comfortable at home and isolated from the remainder of family. This same public health worker, as so many are doing now, can get the best results by picking out those members of the family who are just beginning to fail in health; these are the patients best handled at State sanatoria for the reason that tuberculosis taken in the early stages can be cured by prolonged rest in bed. This prolonged rest in bed can be, under exceptional circumstances carried out in the home but in the far greater majority of cases routine sanatorium treatment is needed on account of the fact that so few have the will power to continue the treatment at home for a period long enough to derive full benefit. It is the early case that is the greatest danger to the greatest number of people and especially is this true of the negro employee in the white home, and as I have said before the bedridden case has probably infected all with whom he has been in contact and is now limited to the immediate members of his family whom he has already infected, yet I do not want to convey the impression that he is no longer a menace, I repeat that he is not the menace he was when mingling freely with his fellow-men ignorant of his disease mainly on account of his lessened sphere of activity, he is still a menace, however, and the care of a hopelessly advanced case of tuberculosis in a family may serve to throw the balance between "infection" and "disease" in another member of that family and thus give us another to care for.

INTERDEPENDENCE OF RACES.

All tuberculosis work in the State would be useless unless directed at both races. The negro is pre-eminently the laborer of the South and is destined to remain so. It is up to the white man who controls his destiny to see that he gets the proper treatment when sick; for the sake of humanity first, from an economic point of view second and for his own sake and that of his family if he sees no other reason. We have treated thirty-eight cooks, eighteen waitresses, twenty-two nurse-girls and sixty-seven girls doing general housework. These all come to us directly from their white employers and from the best families in the State, in this list are included two cooks from two ex-governors of this State. Remember, the greatest percentage of tuberculous infection is received in childhood and this class of labor is more intimate with the baby than some members of that child's own family.

SOME SPECIAL OBSERVATIONS.

AGE.

Careful study of our age records and a comparison with institutions admitting only whites show a further proof of the theory of "Infection and resistance in mutual interaction." Surgeon-General Cumming, in the International Journal of Public Health, quotes from Brownlee's report Number 48 in his "Investigation into the Epidemiology of Phthisis in Great Britain and Ireland"—as follows:

"Brownlee, from an analysis of the mortality statistics in England and Wales, draws the conclusion that three types of phthisis exist, one, which he calls the 'young adult' type, having its maximum mortality among males between the ages of twenty and twenty-five years; a second, the 'middle age' type with a maximum mortality between forty-five and fifty-five; and a third, the 'old age' type, causing a maximum number of deaths between fifty-five and sixty-five. These types are found to be distributed very unequally throughout Great Britain and Ireland. He illustrates the age distribution of phthisis mortality in different areas in a series of diagrams." Those diagrams show the London area to have the highest mortality in the "middle age" type. Shetland and other remote areas to predominate in the "young adult" type. The "old age" type seemed to predominate in areas following certain occupation. In other words, the "middle age" type is marked exactly where contact is most intense, the "young adult" type is prevalent exactly in those areas most isolated from contact with the outside world. He further finds a negative correlation between these two types and a positive one between the "young adult" type and the "old age" type. He also finds a positive correlation between the "standard death rate" from all causes and the "middle age" type and a negative correlation between the "young adult" type and the "standard death rate" from all causes.

Interpreted in terms of the above theory this means that the highest death rate in the young is due to lessened resistance from lack of contact. The high death rate in the middle aged, found where conditions are less healthy and opportunity for infection greater, is due to a more chronic form of the disease from previous infection. Our average age is twenty-two years and four months. Our greatest number of cases occur between twenty and thirty and is quadruple the number between thirty and forty. We have a greater number admitted between ten and twenty than from thirty to forty and this in spite of the fact that we admit very few children under fourteen years of age. Practically all institutions for whites show an average age between twenty-eight and thirty-two. This would indicate that the "young adult" type of tuberculosis predominates in the negro, this being true the high death rate would be due to lessened resistance rather than unhealthy surroundings.

MULATTO VERSUS BLACK.

These tables show eighteen per cent of blacks admitted in first and second stages and thirty-seven per cent improvements. Thirty per cent of browns were classed in first and second stages and forty per cent showed improvement. In the bright mulatto we had forty-nine per cent to show improvement and thirty-five per cent admitted in first and second stage. Note the ascending percentage of improvements from black to bright mulatto. This was also noted in last years annual report. But you will also note the greater percentage of early cases admitted in bright mulatto. That better results have been gotten in the bright mulatto is unquestionable, whether this is due to inherited immunity from some ancestor with increased resistance or whether that ancestor transmitted some of his intelligence and other traits of character necessary to make an early and prolonged fight against the disease can only be figured out by arithmatical progression. I am still inclined to favor intelligence in spite of data that continues to pile up showing the bright mulatto to have a better resistance.

SYPHILIS AS A COMPLICATION.

I know of no better opportunity offered anywhere to study pulmonary syphilis than is offered at Piedmont. Although our percentage of infection with syphilis is not so high as generally recorded in the Negro race we show a greater percentage than the general populace. Our records show instances too numerous and results too pointed to dispute the fact that pulmonary syphilis is quite a common occurrence, and yet in the few cases followed to the autopsy table we seemed to be pursuing a myth. No syphilis lesions are recorded by the pathologist. Our results show that salvarsan and mercury are either of decided benefit to certain cases of pulmonary tuberculosis or else pulmonary syphilis is therapeutically demonstrable in a certain percentage of pulmonary diseases and it is quite significant that those cases benefitted are cases showing a 4 + Wassermann test. It might be said that improvement in pulmonary tuberculosis followed the systemic treatment for syphilis but a comparison of chest charts shows a too rapid improvement in chest finding to be entirely accounted for in this way. Wassermann 4 + men eleven per cent, women ten per cent. Total number treated for syphilis thirteen, of which four showed marked improvement in general condition and chest findings. Five showed some improvement in general condition. One showed no improvement and three all symptoms aggravated. Total number showing positive sputum ten, negative three. It is also most significant that of the four showing marked improvement in both general condition and chest findings three showed negative sputum and one positive. I consider these cases of pulmonary syphilis proven by the therapeutic test. Those showing some improvement in general condition may possibly have been systemic syphilis which improved under treatment.

HOOKWORM.

Our percentage of infection continues less than one per cent. These examinations have been checked and rechecked.

COMMENTS ON BUDGET.

A detailed business statement accompanies this report, but I want especially to call your attention to a few pertinent facts. First, in a questionnaire sent to forty-four Southern and Eastern State sanatoria, Piedmont stands next to lowest in cost per capita—the average cost per capita for these forty-four sanatoria as shown by this questionnaire is $2.51 for 1920 against our cost of $1.85. The operation of the budget for the past two years has shown us that efficiency can best be had by certain additions to our personnel, which additions are included in our request. They consist of two graduate colored nurses to assist the head nurse in the training of the pupil nurses in detail ward work. A housekeeper is substituted for the assistant head nurse. One industrial teacher for occupational therapy is added and one carpenter for general repair work—his duties to be also those of inside foreman. One engineer-mechanic is added for the second year if the request for the central heating plant is granted. One day orderly is added, one night orderly and five nurses in training for the first year and ten for the second year. If the request for additions is granted we are adding two janitors for the second year. No general increase in salaries is requested. We request $1,500.00 for our head nurse who is at present paid $1,200.00 by order of the committee. An increase of $750.00 is requested for the resident physician, it being our experience during the past two years that one cannot be obtained for less. Your committee recommends an increase in the salary of the medical director. All other requests are based on actual expenditures after taking inventories into consideration. In our estimates for maintenance no effort has been made to forecast any changes in market prices.

For the year 1922-23 we request $58,450 for capital outlays and $58,557 for maintenance. For the year 1923-24 we request $58,450 for capital outlays and $70,217 for maintenance.

PERSONNEL.

Dr. I. D. Steinmetz left us in February. Dr. F. Walter took the place for one month. Dr. R. C. Carnal, formerly with the State Board of Health, is now with us as resident physician. Miss Grace A. Hamilton, head nurse, is taking a post-graduate course, and Miss Mary E. Gilliam, formerly head nurse, is temporarily filling the position. Mr. Jos. V. Foley continues as bookkeeper and steward. Miss Ethel C. Dodson as stenographer.

RECOMMENDATIONS.

Our waiting list at present is fifteen men and thirty women, a total of forty-five. Examination and two weeks observation will show that approximately twenty-five per cent of these are not admissible for treatment, and with those who change their minds before we reach their names only about twenty-five or thirty of this list be admitted for treatment. A short waiting list is necessary to keep beds filled with proper type of case. There are, however, any number of hopelessly advanced type of case who do not apply for admission here now, knowing we discourage the admission of such cases. Some of them should be admitted but for the fact that we would jeopardize our whole work to overload with this type of case. As I have previously said this type of case is best handled in local hospitals at home, however on account of our proximity to the centre of population and on account of a total lack of provision in rural part of State for the advanced case of tuberculosis, I am recommending to you that one forty-bed hospital be erected at Piedmont strictly for the segregated case, this will relieve a good many counties of dangerous menaces, and a good many white employers of unwelcome charges. The present two pavilions would then be strictly for treatment, giving Piedmont Sanatorium 100 beds for treatment and Piedmont hospital forty beds for segregation. The forty-bed hospital can be built on grounds far enough away from present buildings not to affect the morale of the treatable case and close enough to be under present system. This building should be built with all conveniences of a good infirmary building and the economic value to the counties of the State will far exceed the value even in this time of "close money."

I further recommend the building of a children's pavilion of twenty beds. This is a feature of tuberculosis work that has been neglected. All up-to-date tuberculous sanatoria have provisions for treating children. We are constantly turning down applications for admission of children and I recommend this pavilion.

The present heating and water system was devised for a forty-bed sanatorium. It being thought by the board not to be expedient at that time to make outlay for a large plant when it was not known how the Negro would respond to the experiment. The sanatorium is no longer an experiment and neither the present water system nor the present heating plant is adequate for the present needs and certainly not for any additions. I have consulted with the State sanitary engineer who agrees with me and has estimated that 75,000-gallon tank on 100-foot tower and twelve-inch pump be put in, the actual cost will be approximately $18,000.00 with proper size underground pipe and fire protection. The present tank and well can be moved to dairy barn for use there and at superintendent's home.

The central heating plant with laundry will cost approximately $25,000.00. At present we operate a laundry in basement of service building. This is a temporary arrangement and we are already badly cramped for room as well as inconvenienced by operation of same under living quarters of staff. The heating plant in basement of service building is also temporary and further additions are impossible. Both of these recommendations are in conformity with original plans of this institution and have been so arranged for that the change was expected as the institution grew.

Some occupation should be taught the arrested case, at present our hennery is the only form of vocational training we have. It is more than self-sustaining, but has not proved a great success for vocational training. I recommend that it be extended and a full-time man employed. I have consulted the man in charge of hennery at Hampton Institute who has given us plans for further extension and has consented to inspect at regular intervals. I consider it advisable to put a colored man in charge of this work on account of intimate contact with patients, for this reason Hampton was asked to advise with him rather than Virginia Polytechnic Institute. The prospective poultryman is a Hampton graduate.

Number of patients treated during year	356
Number of patients in Sanatorium September 30, 1921	89
Number of patients reported on	267
Of this number there were	
Admitted for segregation	73 or 27%
Admitted for treatment	194 or 73%
Of this 194 admitted for treatment there were:	
Discharged arrested	1 or .5%
Discharged apparently arrested	20 or 10.0%
Discharged quiescent	38 or 20.0%
Discharged improved	48 or 25.0%
Discharged unimproved	10 or 5.0%
Discharged progressive	68 or 35.0%
Died	2 or 1.0%
Suspicious	3 or 1.5%
Non-tuberculous	2 or 1.0%
Not examined	2 or 1.0%
	194 or 100.0%

Of seventy-three admitted for segregation there were:	
Discharged progressive	30
Segregated and died in sanitarium	43
	73

SUMMARY OF TABLES No. 1 and No. 2.

Not Including Segregated Cases—Number of Patients Reported on in this Table, 194.

CONDITION ON ADMISSION		Condition on Discharge									
		Suspicious	Non-T. B.	Not Examined	Apparently Arrested	Arrested	Quiescent	Improved	Unimproved	Progressive	Dead
Suspicious	3	3	......	......	......	......	......	......	......	......	......
Non-tuberculous	2	......	2	......	......	......	......	......	......	......	......
Not examined	2	......	......	2	......	......	......	......	......	......	......
Incipient	20	......	......	......	10	1	4	1	2	2	......
Moderately advanced	45	......	......	......	9	......	13	11	2	8	2
Far advanced	122	......	......	......	1	......	21	36	6	58	......
	194	3	2	2	20	1	38	48	10	68	2

TABLE No. 1.

Patients Who Remained in Sanatorium Less Than Three Months.
(Segregated cases included.)
Number of Patients Reported on in This Table, 162.

CONDITION ON ADMISSION		Condition on Discharge									
		Suspicious	Non-T. B.	Not Examined	Apparently Arrested	Arrested	Quiescent	Improved	Unimproved	Progressive	Dead
Suspicious	2	2	......	......	......	......	......	......	......	......	......
Non-tuberculosis	2	......	2	......	......	......	......	......	......	......	......
Not examined	2	......	......	2	......	......	......	......	......	......	......
Incipient	13	......	......	......	4	......	4	1	2	2	......
Moderately advanced	25	......	......	......	......	......	6	10	2	6	1
Far advanced	118	......	......	......	......	......	2	17	4	64	31
Totals	162	2	2	2	4	......	12	28	8	72	32

TABLE No. 2.

Patients Who Remained in Sanatorium Three Months or More.
(Segregated cases included.)
Number of Patients Reported on in This Table, 105.

CONDITION ON ADMISSION		Condition on Discharge									
		Suspicious	Non-T. B.	Not Examined	Apparently Arrested	Arrested	Quiescent	Improved	Unimproved	Progressive	Dead
Suspicious	1	1	......	......	......	......	......	......	......	......	......
Incipient	7	......	......	......	6	1	......	......	......	......	......
Moderately advanced	20	......	......	......	9	......	7	1	......	2	1
Far advanced	77	......	......	......	1	......	19	19	2	24	12
Totals	105	1	......	......	16	1	26	20	2	26	13

TABLE No. 3.

Effect of Treatment on Prominent Symptoms—Patients Who Remained Less Than Three Months.

Number of Patients Reported on in This Table, 166.

	On Admission	On Discharge	During Residence	Negative or No Expectoration
Number of patients whose expectoration contained bacilli	85	92	102	33
Number of patients who had hemorrhages	....	....	10	....
Number of patients who did not have hemorrhages	....	....	156	....
Number of patients who gained weight	....	....	33	....
Number patients who lost weight	....	....	5	....
Number of patients whose weight was stationary	....	....	1	....
Number patients not weighed	....	149	149	....
Number patients who died	....	....	32	....

TABLE No. 4.

Patients Who Remained in Sanatorium Three Months or More.

Number of Patients Reported on in This Table, 101.

Number of patients whose expectoration contained bacilli	78	63	89	21
Number of patients who had hemorrhages			7	
Number of patients who did not have hemorrhages			94	
Number of patients who gained weight			54	
Number patients who lost weight			7	
Number of patients whose weight was stationary			2	
Number patients not weighed		35	35	
Number patients who died			13	
Average gain in weight			8¼	
Average loss in weight			4	

TABLE No. 5.

Character of Onset of Disease.

Number of Patients Reported on in This Table, 267.

Catarrhal	170
Insidious	59
Plueritic	22
Hemorrhagic	8
Febrile	4
Non-tuberculous	2
Not examined	2
Total	267

TABLE No. 6.

Age of Patients Discharged.

Number of Patients Reported on in This Table, 267.

Between 10 and 20 years	65
Between 20 and 30 years	122
Between 30 and 40 years	50
Between 40 and 50 years	25
Between 50 and 60 years	05
Total	267

Average age of patients discharged from Sanatorium—24 years, 5 months.
Average age of patients who died in Sanatorium—26 years, 2 months, 3 days.

TABLE No. 7.

Results by Color.

Black—47 Cases.

CONDITION ON ADMISSION		CONDITION ON DISCHARGE									
		Suspicious	Non-T. B.	Not Examined	Apparently Arrested	Arrested	Quiescent	Improved	Unimproved	Progressive	Dead
Suspicious	1	1	......	......	......	......	......	......	......	......	......
Moderately advanced	8	......	......	......	2	......	2	3	1	......	......
Far advanced	38	......	......	......	......	......	3	6	3	17	9
Totals	47	1	......	......	2	......	5	9	4	17	9

Brown Mulatto—157 Cases.

CONDITION ON ADMISSION		Suspicious	Non-T. B.	Not Examined	Apparently Arrested	Arrested	Quiescent	Improved	Unimproved	Progressive	Dead
Suspicious	2	2	......	......	......	......	......	......	......	......	......
Non tuberculous	2	......	2	......	......	......	......	......	......	......	......
Not examined	2	......	......	2	......	......	......	......	......	......	......
Incipient	20	......	......	......	8	......	5	5	1	1	......
Moderately advanced	28	......	......	......	5	......	7	5	1	8	2
Far advanced	103	......	......	......	2	......	11	12	1	50	27
Totals	157	2	2	2	15	......	23	22	3	59	29

Bright Mulatto—63 Cases.

CONDITION ON ADMISSION		Suspicious	Non-T. B.	Not Examined	Apparently Arrested	Arrested	Quiescent	Improved	Unimproved	Progressive	Dead
Incipient	6	......	......	......	2	1	1	2	......	......	......
Moderately advanced	16	......	......	......	1	......	5	7	1	2	......
Far advanced	41	......	......	......	1	......	5	8	1	19	7
Totals	63	......	......	......	4	1	11	17	2	21	7

TABLE No. 8.

Geographical Distribution by Cities.

Ashland	1	Norfolk	24
Bedford City	2	Petersburg	14
Charlottesville	3	Portsmouth	12
Danville	2	Richmond	16
Fredericksburg	2	Roanoke	8
Hampton	7	Staunton	1
Lynchburg	4	Suffolk	4
Newport News	20	Winchester	1

TABLE No. 9.

Geographical Distribution by Counties.

Amherst	1	Frederick	2	Northampton	6
Accomac	7	Fauquier	4	Nansemond	6
Albemarle	3	Franklin	2	Nelson	1
Augusta	3	Fluvanna	1	Orange	1
Amelia	1	Gloucester	4	Prince William	2
Brunswick	1	Goochland	1	Pittsylvania	4
Botetourt	1	Greene	1	Prince George	5
Bedford	7	Greensville	2	Prince Edward	10
Buckingham	1	Giles	1	Patrick	1
Clarke	1	Halifax	9	Roanoke	8
Charlotte	2	Hanover	2	Rockbridge	1
Charles City	1	Henrico	20	Rappahannock	1
Campbell	5	Henry	2	Southampton	5
Caroline	3	Isle of Wight	2	Smyth	1
Chesterfield	2	Lancaster	1	Sussex	3
Culpeper	3	Lunenburg	3	Spotsylvania	1
Dinwiddie	15	Mecklenburg	3	Surrey	2
Dickenson	2	Montgomery	1	Warren	1
Elizabeth City	7	Norfolk	62	Warwick	5
Essex	4	Nottoway	4	Washington	2

TABLE No. 10.

Occupations of Patients.

Barber	1	Farmers	12	Railroad workers	8
Bell-boy	1	Housekeepers	49	Riveters	2
Blacksmith	1	Housewives	30	Shop girls	1
Bookkeepers	2	Hairdresser	1	Seamstresses	2
Butler	1	Laborers	29	Soldiers	2
Bushelman	1	Lumberman	1	Steamfitter	1
Carpenters	2	Longshoreman	1	School girls	9
Chauffeurs	8	Laundrymen	3	School boys	6
Cleaners and pressers	2	Laundresses	1	School teachers	4
Coach-cleaners	1	Livery boy	1	Shipyard workmen	3
Clerks	3	Machinist	1	Students	6
Coal miners	5	Merchant	1	Shoemakers	1
Cooks	9	Musician	1	Steel driller	1
Cobbler	1	Nursemaids	4	Stevedore	1
Chambermaids	9	Office boy	1	Sawyer	1
Electricians	2	Poolroom keeper	1	Tinner	1
Engineer	1	Porter	1	Waiters	4
Factory workers	6	Plasterer	1	Occupation not given	15
Fireman	1				

FARM REPORT.

CREDITS.

Milk delivered to sanatorium, 11,048 gallons, at 40 cents	$ 4,419 20	
Veal (dressed), 596 pounds, at 20 cents	119 20	
Vegetables (detailed below)	937 32	
Pork (dressed), 2,124 pounds, at 15 cents	318 60	
Hauling 360 tons coal, at $1.00 per ton	360 00	
Hauling freight, 30 days, at $4.00 per day	120 00	
Total credits		$6,274 32

DEBITS.

Farm payroll	$ 2,157 36	
Farm repairs	226 20	
Forage	2,503 58	
Agricultural supplies	558 08	
Motor vehicle supplies	257 56	
Insurance	58 00	
Total debits		5,760 78
Net profit		$ 513 54

Detailed Account of Vegetables Delivered to Sanatorium and the Value Thereof —See above:

String beans, 22 bushels, at $1.00 per bushel	$ 22 00
Tomatoes, 30 bushels, at $1.25 per bushel	37 50
Squash, 78 dozen, at 25 cents per dozen	19 50
Onions, 33 bushels, at $1.50 per bushel	49 50
Beets, 26 bushels, at $1.00 per bushel	26 00
Cabbage, 3,804 pounds, at 3 cents per pound	114 12
Corn, 480 ears, at 2 cents per ear	9 60
Lima beans, 36 bushels, at $1.00 per bushel	36 00
Cucumbers, 30 dozen, at 25 cents per dozen	7 50
Turnips, 40 bushels, at 75 cents per bushel	30 00
Leek, 166 dozen bunches, at 25 cents	41 50
Spinach, 20 bushels, at $1.00 per bushel	20 00
Kale, 56 bushels, at $1.00 per bushel	56 00
Lettuce, 33 bushels, at $1.50 per bushel	49 50
Peas, 49 bushels, at $2.00 per bushel	98 00
Radish, 318 bunches, at 7 cents per bunch	22 26
Spring onions, 140 bunches, at 7 cents per bunch	9 80
Carrots, 122 bunches, at 7 cents per bunch	8 54
White potatoes, 120 bushels, at $1.50 per bushel	180 00
Sweet potatoes, 80 bushels, at $1.25 per bushel	100 00
	$ 937 32

As shown above, a profit of $513.54 has been realized from farm—this being absorbed in food supplies delivered to sanatorium. In spite of the fact that this has been an unusually hard season on crops.

The inventory of live stock on farm as of September 30, 1921, follows:

Dairy:			
18	Cows, valued at $100.00 each	$ 1,800 00	
3	Yearling heifers, valued at $35.00 each	105 00	
2	Registered Holstein calves, at $50.00 each	100 00	
3	Grade calves, valued at $15.00 each	45 00	
1	Pure-bred Holstein bull, valued at	150 00	
27	Total at dairy		$ 2,200 00
Piggery:			
1	Registered boar	$ 100 00	
7	Brood sows, valued at $50.00 each	350 00	
5	Gilts (registered), valued at $50.00 each	250 00	
20	Shoats, valued at $5.00 each	100 00	
17	Pigs (entitled to registry), at $15.00 each	255 00	
50	Total at piggery		$ 1,055 00

SUMMARY OF CAPITAL OUTLAYS APPROPRIATION.

Years 1920-21 *and* 1921-22.

Appropriated for capital outlays—1920-21	$29,518 00	
Appropriated for capital outlays—1921-22	7,750 00	
Total both years		$ 37,268 00
Expended—Both years		35,414 49
Balance, October 1, 1921		$ 1,853 51

DETAILED CAPITAL OUTLAYS EXPENDITURES.

March 1, 1920, *September* 30, 1921.

Hospital equipment:	
Appropriation	$ 2,920 00
Credits	135 00
Diverted from spur siding	212 50
Public Health Service funds	2,581 00
Total	$ 5,848 50
Expended	5,848 50
Sewer system:	
Appropriation	$ 5,000 00
Credits	53 00
Public Health Service funds	2,093 51
Total	$ 7,146 51
Expenditures	7,146 51
Women's building:	
Appropriation—1920-21	$ 5,000 00
Appropriation—1921-22	5,000 00
Total	$ 10,000 00
Expended:	
Diverted to refrigerating plant	$ 2,336 00
Diverted to farm tractor	457 50
Spent for building proper	6,065 72
	$ 8,859 22
Balance (diverted to X-ray equipment)	1,140 78
Men's building:	
Appropriation—1920-21	$ 2,500 00
Appropriation—1921-22	2,500 00
Total	$ 5,000 00
Expenditures	4,812 27
Balance (diverted to X-ray equipment)	$ 187 73
Refrigerating plant:	
Appropriation—1920-21	$ 1,000 00
Diverted from women's building	2,336 00
Total	$ 3,336 00
Expenditures	3,336 00
Heating system:	
Appropriation—1920-21	$ 3,000 00
Expenditures	3,000 00
Hot-water system:	
Appropriation—1920-21	$ 2,000 00
Expenditures	2,000 00
Storehouse:	
Appropriation—1920-21	$ 600 00
Expenditures	600 00

Detailed Capital Outlays Expenditures—CONTINUED.

Garage:		
Appropriation—1920-21		$ 250 00
Balance (diverted to purchase dishwasher)		$ 250 00
Farm equipment:		
Appropriation—1920-21		$ 823 00
Credits		127 50
Diverted from spur siding		867 50
Diverted from women's building		457 50
Total		$ 2,275 50
Expenditures		2,222 70
Balance		$ 52 80
Dairy barn:		
Appropriation—1920-21		$ 4,000 00
Expenditures		4,000 00
Fencing:		
Appropriation—1920-21		$ 320 00
Public Health Service funds		233 60
Total		$ 553 60
Expenditures		553 60
Spur siding:		
Appropriation—1920-21		$ 1,080 00
Diverted to hospital equipment	$212 50	
Diverted to farm tractor	867 50	
		1,080 00
Draining, ditching and tiling:		
Appropriation—1920-21		$ 500 00
Public Health Service funds		89
Total		$ 500 89
Expenditures		500 89
Clearing woods:		
Appropriation—1920-21		$ 250 00
Appropriation—1921-22		250 00
Public Health Service funds		547 45
Total		$ 1,047 45
Expenditures		1,047 45
Laundry equipment:		
Appropriation—1920-21		$ 275 00
Balance (diverted to purchase dishwasher)		$ 275 00

CAPITAL OUTLAYS EXPENDITURES.

Authorized by Board.

Employee's quarters—one for men—one for nurses	$ 4,114 40
Milk house (added to dairy barn)	361 71

By Intention of Governor and Authority of Board (From Maintenance Funds)

Administration equipment:	
Allowed	$ 380 00
Credits	17 50
Total	$ 397 50
Expenditures	397 50
Building materials:	
Allowed	$ 250 00
Expended	250 00
Highway materials:	
Allowed	$ 125 00
Expended	125 00
Fire equipment:	
Allowed	$ 250 00
Public Health Service funds	207 87
Total	$ 457 87
Expended	457 87
Dairy equipment, etc.:	
Allowed	$ 1,703 00
Credits and Public Health Service funds	125 95
Total	$ 1,828 95
Expended	1,828 95

NOTES.—Written permission was obtained from the Governor for each and every diversion of funds from one function to another.

Whenever Public Health Service funds were used to supplement appropriations, or for new construction, it was always with the consent and approval of the committee.

RECEIPTS AND DISBURSEMENTS.

From October 1, 1920, *to September* 30, 1921.

RECEIPTS.

By Balance in Auditor's office October 1, 1920	$ 18,271 51
Balance in bank, October 1, 1920	10,286 58
Appropriation for year ending February 28, 1922	49,167 00
Sale of drugs	5 25
Credit for empty cement bags	99 95
Sale of hospital equipment	135 00
Sale of office equipment	17 50
Farm revenue	5 00
Sale of food supplies	736 15
Collections for laundry	2,020 54
Sale of live stock	112 50
Interest accrued on deposits	325 04
Patients' board	19,787 62
Settlement for small fire (general repairs)	25 00
Settlement of breakage claim by railroad	18 88
Cancelled checks	10 75
Rent	150 00
Cancelled checks	18 35
Sale of medical supplies	271 78
Sale of forage	22 50
Sale of office supplies	2 25
Collection on sale of cement	53 00
Collection for telegrams, etc.	32 03
Transient board	43 30
Nurses books and uniforms	93
Total	$101,618 41

DISBURSEMENTS.

Buildings	$ 14,126 43
Clearing woods	859 92
Cheese cloth	40 81
Drugs	805 50
Draining, ditching and tiling	140 45
Expense of board meetings	251 60
Equipment—Farm	55 70
Hospital	1,450 28
Household	926 89
Office	147 40
Fire	208 39
Fencing	233 81
Farm payroll	2,157 36
Farm improvements	361 71
Fuel	2,310 58
Food supplies	13,200 91
Heating plant	2,243 28
Insurance	871 69
Laundry	1,827 09
Live stock	135 00
Light, heat and power	2,203 57
Meats	383 41
Roadways, ditching—grounds	125 00

Receipts and Disbursements—CONTINUED.

Repairs—Auto		$ 263 66
General		1,163 72
Laundry		88 18
Farm		241 95
Refund patients' board		376 42
Salaries and wages		15,971 39
Supplies—Agricultural		558 08
Auto		784 51
Farm cleaning and disinfectant		18 75
Hospital cleaning and disinfectant		265 66
Medical		3,145 94
Forage		2,885 54
Household		1,048 14
Laundry		104 34
Office		233 57
Refrigerating		229 41
Stationery, postage and printing		43 25
Sewerage and water system		4,667 90
Telephone and telegraph		244 16
Traveling		444 24
Refrigerating plant		1,763 98
Total actual expenditures		$ 79,609 57
Balance in bank September 30, 1921:		
Maintenance	$2,898 20	
Capital outlays	1,853 51	
		4,751 71
Balance in Auditor's office September 30, 1921 (maintenance)		17,257 13
		$101,618 41

STATEMENT OF COST.

October 1, 1920, *September* 30, 1921.

Medical supplies:			
Inventory September 30, 1920		$ 848 12	
Purchases		3,992 25	
Total		$ 4,840 37	
Less inventory September 30, 1921	$1,619 80		
Less sales	277 03		
		1,896 83	
Net balance			$ 2,943 54
Board meetings, expense of			251 60
Forage supplies:			
Inventory September 30, 1920		$ 1,340 00	
Purchases		2,885 54	
Total		$ 4,225 54	
Less inventory September 30, 1921	$ 779 00		
Less sales	36 20		
		815 20	
Net balance			3,410 34
Farm payroll			2,157 36
Farm repairs:			
Repairs		$ 241 95	
Sales		10 75	
Net balance			231 20
Fuel:			
Inventory September 30, 1920		$ 2,113 00	
Purchases		2,310 58	
Total		$ 4,423 58	
Less inventory September 30, 1921—250 tons		1,750 00	
Net balance			2,673 58
Insurance			871 69
Light, heat and power			2,203 57
Refund patients' board			376 42
Refrigerating supplies			229 41
Agricultural supplies			558 08
Auto supplies			784 51
Food supplies:			
Inventory September 30, 1920		$ 3,200 00	
Purchases		13,250 73	
Total		$ 16,450 73	
Less inventory September 30, 1921	$2,107 56		
Less sales	785 97		
Less transient board	43 30		
		2,936 83	
			13,513 90
Office supplies:			
Inventory September 30, 1920		$ 10 00	
Purchases		233 57	
Total		$ 243 57	

Statement of Cost—CONTINUED.

Less inventory September 30, 1921	$ 200 00		
Sales	2 25		
		$ 202 25	
Net balance			$ 41 32
Repairs—General:			
Repairs		$ 1,283 72	
Less credits	$ 145 00		
Less inventory September 30, 1921	9 50		
		154 50	
Net balance			1,129 22
Telegraph and telephone:			
Telegraph and telephone	$ 244 16		
Less collections	32 03		
Net balance			212 13
Salaries and wages—Sanatorium:			
Salaries and wages	$13,561 29		
Less credits	18 35		
Net balance			13,542 94
Traveling expenses			444 24
Household supplies:			
Inventory September 30, 1920		$ 225 00	
Purchases		1,048 14	
Total		$ 1,273 14	
Less inventory September 30, 1921		328 54	
Net balance			944 60
Auto repairs			263 66
Farm cleaning and disinfecting supplies			18 75
Hospital cleaning and disinfecting supplies:			
Inventory September 30, 1920		$ 100 00	
Purchases		265 66	
Total		$ 365 66	
Less inventory September 30, 1921		174 53	
Net balance			191 13
Fresh meats			383 41
Total expenditures			$ 47,376 60
Less refund of patients' board			376 42
			$ 47,000 18
Less bills payable September 30, 1920			2,824 48
			$ 44,175 70
Plus bills payable September 30, 1921			3,941 11
Grand total			$ 48,116 81

With a daily average of 83.3 patients from October 1, 1920, to September 30, 1921, shows the cost to be $1.582 per day.

The above figure makes no allowance for laundry payroll, or laundry repairs and supplies. If these are considered they will bring the cost per capita up to $1.653 per diem.

Statement of Cost—CONTINUED.

Laundry supplies:		
Inventory September 30, 1920	$ 250 00	
Purchases	104 34	
Total	$ 354 34	
Less inventory September 30, 1921	131 10	
Net balance		$ 223 24
Laundry repairs		88 18
Laundry payroll		1,827 09
Total		$ 2,138 51
Total with laundry included		50,255 32

Making a total per capita cost of $1.653, including operation of the laundry.

The cost per capita as shown is divided as follows:

Salaries and wages	$13,794 54	or	27.4%
Food supplies	20,274 04	or	40.3%
Other supplies, etc.	16,186 74	or	32.3%
Total	$50,255 32	or	100.0%

This cost per capita per diem, i. e., $1.65 is divided as follows:

Salaries and wages	$ 45
Food supplies	66
Other supplies, etc.	54
	$1 65

Distribution of Antitoxin and Vaccine Virus.

	Number Units Diphtheria Antitoxin	Number Units Tetanus Antitoxin	Number Small-pox Vaccine	TYPHOID		WHOOPING COUGH		Antimeningococcus Serum
				Syringes	Ampoules	Syringes	Ampoules	
October, 1920	6,961,500	83,500	3,550	75	558	104	123	....
November, 1920	5,838,000	52,000	7,420	53	128	78	128	60 C. C.
December, 1920	3,237,500	98,000	1,410	32	16	81	87	135 C. C.
January, 1921	1,862,000	61,000	3,570	12	22	95	108	15 C. C.
February, 1921	777,000	56,000	3,900	32	114	57	56	15 C. C.
March, 1921	336,500	77,500	3,540	33	59	44	144	135 C. C.
April, 1921	80,000	48,500	3,050	221	98	62	102	240 C. C.
May, 1921	1,212,000	62,000	1,510	306	1,200	86	64	870 C. C.
June, 1921	1,148,000	87,000	4,850	454	1,683	70	117	....
July, 1921	873,500	100,500	6,900	518	2,123	72	89	75 C. C.
August, 1921	2,685,500	94,000	1,820	553	1,671	36	68	75 C. C.
September, 1921	4,588,500	189,000	3,430	115	741	21	85	....
Total	29,900,000	1,009,000	44,950	2,404	7,813	806	1,221	1,620

Tuberculosis Education

AGNES D. RANDOLPH, *Director.*

The State Board of Health created the Bureau of Tuberculosis Education in March of this year. Since its foundation the bureau has had before it two objects, to reach the individual consumptive and to carry to the mass of the people the new gospel of prevention and cure.

In its endeavor to effect these objects, the bureau has recognized two divisions: field clinics for examination of the tuberculous and educational propaganda. Since its establishment, however, the bureau has also done special work for the Tuberculosis Committee appointed by the legislature of 1920, of which Honorable J. Sinclair Brown is chairman. In reality, therefore, the work of the past six months has fallen into three divisions, two considered as desirable to continue for the ensuing year, the third a temporary one only.

FIELD WORK.

The amount of money which could be spent on the development of the field work was limited, since the appropriation was inadequate for extensive work, and from the limited budget sufficient money must be spared to carry on the work of the Tuberculosis Committee, which had no fund allotted for its study.

The State Board of Health had conducted field clinics for four years in co-operation with the Virginia Tuberculosis Association. Details for such a campaign had, therefore, been developed. It had been found that preliminary visiting by a public health nurse among known cases and their families—"contacts" was an essential part of the clinic work, and that visits following a clinic were also essential if the community was to derive the full benefit from the service. Even in those communities where public health nurses were already located, such preliminary and follow-up visiting were necessary, because of the heavy programs of the county nurses.

Since the clinic fund was small the State Board of Health offered again to co-operate with the Virginia Tuberculosis Association during the summer months. A division of salary and traveling expense was arranged on a fifty per cent basis. Throughout May, June and July, the clinician worked continuously for the Virginia Association.

The first clinic held by the bureau was in Prince George county, one hundred and sixty applicants were examined, forty-eight cases of tuberculosis were found, fifteen of which were active. Of course, seven needed sanatorium care. Two were admitted to Piedmont at once. Other applications are in, and funds will probably be raised for their support. The second clinic was held in Albemarle county and followed a former campaign in which 1,600 chest examinations were made.

From May to August Dr. W. E. Brown, former assistant physician at Catawba, served as clinician. The resignation of Dr. Klotz from Blue Ridge Sanatorium created a vacancy there, to which Dr. Brown was elected. No successor to Dr. Brown has been found. At present the State has two field nurses on its staff. State physicians have been most cordially co-operative and have served for the bureau at various clinics. Under the present conditions and with the existing force, two clinics will probably be the maximum number feasible for each month.

EDUCATIONAL PROPAGANDA.

No effective effort had ever been made in the State to reach industrial groups with propaganda. It has been thought wise, therefore, to select this group for special intensive propaganda and, in addition, to continue a more generalized campaign. With this in mind, the bureau has secured the co-operation of the labor bureau. Placards have been printed, giving the early symptoms, the cure and other information regarding the disease. These will be distributed widely throughout the State, with the assistance of Mr. John Hirschberg and his inspectors. A pamphlet has also been written with this special problem in mind. This will be available for any whose interest is aroused.

SPECIAL TUBERCULOSIS COMMITTEE.

Probably the most important effort undertaken during the year in Virginia, so far as tuberculosis may be concerned, was the investigation made by the legislative committee created by the General Assembly of 1920.

It is reasonably certain that the coming legislature will be largely influenced by the report of that committee, which has been studying the subject from many angles. It is not to be hoped that the conclusions of the committee can be regarded as final, but it is fair to say that, with the brief time and limited means at the disposal of the investigators, a most careful and detailed study was made and no available source of information was overlooked.

Vital Statistics for 1920

W. A. PLECKER, M. D., *Registrar of Vital Statistics.*

In presenting this report of births and deaths, which is in the nature of a preliminary one, it is done with the expectation that it will not agree in details with that which will be issued later by the United States Bureau of the Census, which includes delayed certificates which reached our office after our tables were made up.

This is especially true of deaths, while there will probably be but little if any variation as to the number of births.

There will also probably be considerable variation in the estimates of deaths from various causes, as no two workers, unless working under absolutely the same conditions and rules, will interpret all given causes in the same way.

The United States Bureau of the Census classifies as diphtheria all certificates of death which give "croup" as the cause, while the State Registrar, knowing the habit of ignorant persons in many localities of calling various symptoms by this term, even in new born infants, prefers to class such deaths as from unknown causes when there was no attending physician.

The totals of births, stillbirths, illegitimate births, marriages and divorces are presented at a glance in the following summary, Table I. Stillbirths are counted separately and are not included as either births or deaths.

TABLE I.

Table II is a summary of births, deaths, marriages and divorces by cities and counties, with rates per 1,000 population.

BIRTHS.

Table III is a study of births by counties, cities and colors. It gives also the plural and illegitimate births, living and stillborn.

There were 66,010 living births, of which 45,308 were white and 20,700 colored, being an increase of 3,147 white and 368 colored births over 1919. For 1919 there was a decrease of 1,476 white births and an increase of 93 colored.

Of these, 43,134 were reported by physicians and 24,718 by midwives and others, including stillbirths. This shows a gain of 6,526 made by physicians as compared with 1919, which is an object aimed at by the Bureau of Vital Statistics. Midwives gained 1,683. These estimates do not include all delayed certificates for 1920.

There were 1,192 white and 636 colored infants born as twins, while 9 white and 3 colored babies were born as triplets, being a loss of 42 white twins and a gain of 10 colored over 1919. There was a loss of 12 white triplets and a gain of 3 colored.

In 1919 Virginia fell below South Carolina and North Carolina only, in the plural birth rates, while in 1918 she led the registration area of the country.

There were reported 3,617 illegitimate births of which 887 were white and 2,730 colored. This shows a gain of 104 white illegitimate births, while the colored gain was actually less, being 102. Every fifty-first birth occurred out of wedlock as against one in fifty-four in 1919. There was one colored child thus born out of each 7.5 births, whilst for 1919 it was one to 7.3.

Virginia in 1918 led the registration area in its illegitimate birth-rate, but in 1919 was exceeded by South Carolina alone, with its excessive colored population, and which for the first time appears in the registration area. The illegitimate rate for 1920 is 54.7 per 1,000 births.

The 1919 rates were, South Carolina 77, Virginia 53.3, Maryland 49.6, North Carolina 44.8. This shows a gain for Virginia from 50.7 and Maryland from 45.7, while North Carolina dropped from 45.3.

While the high standing in illegitimacy in these four States is due largely to the colored population and to special care in securing information as to that point, the lamentable fact remains that the evil amongst the white population of Virginia is on the increase.

While the automobile, suggestive motion pictures, the modern dances and style of dress, all tend to laxity of thought and conduct, the foundation cause is the woeful and growing lack of parental training and control in the homes.

While the 1919 rate was for colored 126.9 per 1,000 births, the white rate was 18.2 for Virginia, as against a white illegitimate rate of 12.0 for the United States registration area. The foreign rate is 4.1, that of Italians being only 1.5, probably due in part to early marriages.

Table XI is a very interesting and instructive comparison of birth-rates by cities and counties, giving their relative standing as to rates. This gives also the comparisons with the year 1919.

Buchanan county, as in previous years, leads the State with a rate of 42.22 births per 1,000 population, with Wise, Dickenson, Russell and Lee following in order.

For the first time, a city stands as high as sixth place, Buena Vista, having a rate of 37.06. We give the credit for this high rate largely to efficient registration. Fredericksburg stands high also, with a rate of 35.02, being 13th on the list. Good registration and the demand of the school authorities for birth cards to prove school-age, we believe has stimulated registration.

Roanoke, with a rate of 30.17, stands 36th and is the highest of the larger cities. Lynchburg, however, is close behind with a rate of 30.16 and stands 38th, due to Bristol slipping in between with a rate of 30.17. This rate of Bristol is specially pleasing, as a few years ago that city was always close to being a tail-ender. This is an illustration of what may be accomplished by effort.

Elizabeth City county makes a much more favorable showing than in the past, and is the 54th in order with a rate of 28.72. This, too, is the last county on the list to have a rate higher than that of the State as a whole, which is 28.58.

Clifton Forge slipped from the 81st place in 1919 to 57th in 1920, with a rate of 28.39. We expect the unusual efficiency of the school authorities in demanding birth-cards, and assisting parents to procure them when physicians had been negligent of this duty, will in the future bring that city higher on the list.

Both Richmond and Norfolk have been improving their birth registration and we were interested in the race between the two, as with Roanoke and Lynchburg. Norfolk came in slightly ahead with a rate of 24.79 and a standing of 95, while Richmond was just behind with a rate of 24.53, and the 97th place. Norfolk county stands 98th, with a rate of 24.42.

We expect both Norfolk city and county to be assisted materially in the future by the enforcement of the rule by the school authorities demanding new pupils to present their birth-cards to prove their ages. This demand has produced quite a shaking-up of those Norfolk doctors who neglected reporting their births in 1914 and 1915.

We call attention now with regret to the lower end of this table.

Mathews county, for some reason which we have never been able to solve, persists in being the tail-ender, standing 117th amongst the 100 counties and 17 cities, having a rate of only 17.04 for those sturdy people. Fairfax, which in the past has been a strong rival for that place, now stands 109th, with a rate of 22.01.

The wealthy and splendid county of Frederick almost crowded Mathews from the last place and stands 116th, with a rate of 17.74.

Staunton, with its large hospital and school population, probably justly holds the third place from the bottom, with a rate of 18.17.

Essex county, with a rate of 19.77 and fourth place from the bottom, probably like the counties below her, has defective birth registration.

Arlington county is somewhat of a surprise, securing as we believe, excellent birth registration, but standing only 113th, with a rate of 20.20.

Newport News, with a standing of 111 and a rate of 20.84, has been a source of grief to our office in the past. We expect, however, a different report in the future.

Warwick seems to have been disorganized by the many army camps within her borders, but we believe should have a higher place than 108 and a rate of 22.09. Their unusual death-rate of 4.90 is almost positive evidence that both birth and death registration are defective.

DEATHS—TABLE V.

There were 30,652 deaths reported to our office, including 92 arriving too late to be included with the copies furnished the United States Bureau of the Census.

Notwithstanding the fact that there were 2,311 deaths from influenza during the early part of the year, the rate of 13.27 per 1,000 of population is the lowest since the first full year's report in 1913, the rate then, when the reports were less complete, being 13.9. The rate for 1919 was 13.85.

The splendid record of reduction in *typhoid fever* deaths from 709 in 1913 to 357 in 1919, shows still further reduction in 1920, to 260.

The reduction of typhoid deaths is the accepted standard of efficiency of public health administration. City, as well as State health departments, are entitled to their part of praise in the saving to the State of these 449 lives of persons chiefly in the prime of life.

The increase in typhoid deaths however, owing to conditions incident to the unusually dry summer, which we fear the 1921 report will show, is convincing evidence that the fight is not yet wholly won.

Malaria deaths, which showed a reduction from 152 in 1913 to 69 in 1919, were still further reduced in 1920 to 51.

The registration of tuberculosis deaths in the beginning was defective, owing to the custom of assigning other causes, to insure the collection of industrial insurance claims. Many of these deaths occur without a physician in attendance, who might sign the death certificate.

By special effort we have been steadily securing more accurate statements to the causes of these deaths, until we brought the number from 3,591 in 1913 to the high water mark of 4,003 in 1915.

Since then there has been, even with better registration, a steady decline to 3,319, in 1920, that being 126 less than the total of 3,445 for 1919.

Of these deaths, the whites with 70 per cent of the State population, furnish 1,545, or 95 per 100,000, while the colored gave 1,774, with a rate 256 per 100,000.

If health workers would follow the method of Stonewall Jackson in separating his foes and then striking the strongest first, they will not neglect the housing, living, educational and social problem of the colored race.

Diphtheria and croup, after reaching a maximum of 374 in 1915, declined year by year to 216 in 1918. It, however, rose to 291 in 1919 and in 1920 to 334. Of these, 281 were white and only 53 were colored.

Whooping cough rose from 291 in 1919 to 463 in 1920. *Scarlet fever* fell from 34 to 32. *Measles* rose from 74 to 94.

The *respiratory diseases*, including bronchitis, lobar and broncho-pneumonia, show a normal increase from 2,515 to 2,616. This would seem to indicate that we have in general use no effective preventive measures for this, one of the chief classes of infective deaths.

The *diarrheal* diseases of infants under two years of age show a gratifying reduction from 1,821 in 1919 to 1,036 in 1920. This should encourage us to renewed effort to instruct the public as to the overwhelming importance of breast feeding and the avoidance of infection.

During 1920 there were reported 2,294 deaths from all causes peculiar to *early infancy*, including congenital debility, prematurity, malformation and injuries and accidents at births, as against 2,035 for the same group in 1919.

If we add to this group the 3,039 still-births we have a total of 5,333, which constitutes the largest of all classes of deaths, largely preventable, as the field of effort for our child-welfare workers. The success attained in some of the large cities through prenatal work, including the diagnosis and treatment of syphilis of the prospective mother, shows this as a hopeful field which we have scarcely entered.

We record with much sorrow the fact that the dreadful toll of *puerperal* deaths has not decreased. There were recorded in 1920 a total of 569 deaths of women in connection with the puerperal state, including 149 from septicemia as against 502 in 1919, with 127 septic deaths.

The rate per 100,000 population for puerperal deaths other than septicemia was for 1920, 18.1, and for 1919, 16.3. The rate for 1920 septicemia deaths was 6.4 and for 1919, 5.5.

There is some consolation, however, in recording the fact that 107 of these puerperal deaths had influenza as a joint, and perhaps chief cause.

Pellagra shows a gratifying decrease from 177 deaths in 1919 to 134 in 1920. The average number of deaths for the previous seven years from 1913 was 257, the highest being 332 in 1915.

Cancer shows an increase from 1,202 deaths in 1919 to 1,299 in 1920.

Drownings dropped from 164 in 1919 to 152 in 1920, while *burns* increased from 275 to 281.

Suicides dropped from 174 to 123, but *homicides* increased from 226 to 260.

Automobile accidents lost 19, dropping from 116 to 97, increasing from 21 in 1913.

Alcoholism increased to 18, from 15 in 1919, the smallest number of such deaths reached since 1913, the highest being 72 in 1914. During the four years from 1913 to 1916 there was a total of 262 deaths from alcoholism, or 65½ a year. For the four years from 1917 to 1920 there was a total of 72 or 18 per year.

There were 254 deaths from *venereal diseases*, including congenital syphilis.

This is doubtless much under the mark, but does not include locomotor ataxia and other secondary diseases. The highest number recorded was 321 in 1917, the lowest 212 in 1918.

TABLE IV.

Though there were more infants born in 1920 than in any previous year, there were actually less *deaths of infants under one year of age.*

The total number was 5,521, as compared with 5,533 in 1919. In 1917 there were 5,941 and in 1918, the influenza year, 6,491.

The rate per 1,000 living births shows the gain more accurately, being for 1920, 84; for 1919, 90; 1918, 102, and 1917, 97.

It is noticeable that the improvement is most marked in those counties and cities in which visiting nurses were doing effective child welfare work during 1920.

Some unusally low rates are believed to be due to defective death registration of infants, especially in counties with a large colored population. Some of these counties are Caroline, Culpeper, Essex, New Kent, Patrick and possibly Shenandoah, Spotsylvania and Westmoreland. The rate in Frederick county of 32 is too low to attribute it wholly to the work of nurses, and the authorities should look for defective infant death registration. Birth registration has also declined from 274 in 1917 to 220 in 1920.

The rate of 20 for Craig in 1919 was so manifestly wrong that attention was called by letter to physicians and local registrars, and by newspaper articles, with the result that the rate in 1920 is nearer what we should expect, 107.

MARRIAGES.

There were 49,502 persons married in 1920, 30,612 of them being white, 18,870 colored, and 20 color not stated.

This is an increase of 493 white, but a decrease of 1,261 colored. The total decrease was 1,402, there being 654 in 1919 with no color stated as against only 20 in 1920.

The rate per 1,000 of population was 21.44, as compared with 22.22 in 1919, 20.26 in 1918 and 21.10 in 1917. The wedding rate would be 10.72, or one-half the marriage rate.

Table VII shows the number of persons married by counties and cities and colors for the three years, 1918, 1919 and 1920.

Table II shows the rate per 1,000 of persons married and divorced.

Washington county has a marriage rate of only 3.71 as against 6.11 in 1919 and 4.60 in 1918.

Fairfax, with a rate of 9.30, is the only other county with a rate below 10. There were six such counties in 1919.

DIVORCES.

It is with much regret that we announce that the number of persons divorced in Virginia, which was 4,798 in 1918 and 6,556 in 1919, has risen in 1920 to the appalling total of 7,280, with a rate of 3.20 per 1,000. Shown in Table VIII.

Table X shows one divorce decree to every 6.71 marriages as against one to 7.76 in 1919, and one to 9.44 in 1918.

These tables show, as in past years, that Alexandria is far in the lead, with 862 persons divorced and a rate of 47.72, Arlington county being second, with a rate of 21.32.

It is pleasing to note that members of the legal profession are alive to the situation, and it is hoped that this part of Virginia will soon refuse to act as dumping ground for Washington.

Other border cities with high divorce rates are Danville, with 8.08 and Bristol 7.13. Other high rates are Richmond, 6.48; Newport News, 6.34; Warwick, 5.96; Elizabeth City, 5.86; Norfolk city, 5.65; Lynchburg, 5.39, and Roanoke, 5.15.

Twenty-five, or one-fourth of the counties, have a divorce rate below 1. per 1,000, while Northumberland, with one divorce, has the low rate of .17.

After the publication of the 1919 divorce report, we were told by one judge, with just pride, that the low divorce rate in his circuit was largely the result of judicial control.

A study of Table IX, which gives the detailed report of divorces by counties and cities, causes, etc., shows that out of a total of 3,690 divorce decrees, only 843 were upon Scriptural ground, 2,688, the bulk of the remainder, being for desertion.

The large number who deliberately ignore their sacred marriage vows, and forsake their partners, seem to point to the opportunity for prevention by legal means, and above all by the creation of a more healthy public sentiment.

It is believed that a considerable per cent of these divorces is the result of hasty war marriages in 1917, three years being required for full divorce, and that possibly this cause will cease to act in another year or two.

If Virginia possessed a law requiring previous notice of the purpose to marry, many of these hasty and ill-advised marriages with resulting desertion and divorce, would not occur, to the shame of the State and the parties concerned.

While much improvement might undoubtedly be secured by proper legislation, the real cause of this whole shameful business, as well as of the increase in illegitimate births and other forms of moral laxness, is due to a decline in the standard of family life and teaching.

The fundamental doctrines of Christianity as obtained from the Scriptures are giving place to superficial and warped ideas and beliefs, largely of Teutonic origin, learned from magazine and other writers and teachers. These fail to magnify the enormity and results of sin, and to inculcate high ideals of life.

PREVENTION OF BLINDNESS.

The enforcement of the law for the prevention of blindness in the new-born by the use of a one per cent solution of nitrate of silver in the eyes, immediately after birth, was placed in charge of the Bureau of Vital Statistics, because of the close contact of this bureau with physicians and midwives through their report of births.

The system which we have established of keeping a check upon the midwives and doctors, we believe is not surpassed by any State having a similar law. We know whether each doctor and midwife is asking for the ampules of nitrate of silver in numbers corresponding with the births reported, and ask for an explanation when they do not request them.

The State chemist has been assisting us by testing our solutions and those we secure from physicians who prefer to use their own. We are thus establishing standards as to the age and character of these solutions.

In our last report the fear was expressed that there would be an additional cost of our material. We have the assurance that this will not be the case and hope that by competitive bids the price may be really somewhat reduced.

We expect, therefore, to be able to continue this work satisfactorily upon the legislative appropriation of $2,500 per year.

We believe that the practice of using a solution of nitrate of silver in the eyes of the new-born is generally observed by physicians and midwives.

The eye specialist for the Staunton school for the blind, expressed the belief that there is already a noticeable decline in the number of cases of ophthalmia neonatorum. Should only one case of blindness be prevented a a year, the State would be well repaid for the cost of administering this work.

OLD RECORDS.

The old records of births and deaths and marriages from 1853 to 1896, formerly in possession of the State Auditor, but now in our keeping, have been arranged chronologically by counties and cities and are readily available. Numerous inquiries have been made, particularly for births occurring during this period, from all parts of the world, chiefly to prove American citizenship and to obtain passports. About two-thirds of such births have been found recorded.

During the past year there has been a strong and growing demand for these old records, as well as for marriages and divorces, to prove various questions in connection with pensions, allotments, war insurance and indemnities.

The service which these records are rendering to the soldiers and sailors of the late war, as well as to their families, abundantly repay the original cost to our bureau of arranging, binding and preserving these old records, which before were stored in an inaccessible manner in the basement of the State Library building.

These are now being preserved in connection with the marriages and divorce records, without further cost, and really constitute a source of income to the State through fees for making searches, though searches made for war purposes are without cost.

ISSUING TRANSCRIPTS OF BIRTHS, DEATHS, MARRIAGE AND DIVORCE RECORDS.

The public is making constantly increased use of these records for various purposes as indicated in Table XII, the information obtained being in many instances of great value.

The work of searching these records takes a considerable portion of the time of a clerk, for which no appropriation is allowed, although $288.42 was turned back into the State treasury for the year ending August 31, 1921, as compared with $279.03 the year preceding. A large number of searches to show the ages of school children have been made, but not included in the report. We are always glad to have the opportunity of thus verifying the completeness of our records.

Many such inquiries come from former Virginians now residents of other States.

TABLE I.

	State Totals				Rate Per 1,000 Population				Rate Per 1,000 Births			
	1917	1918	1919	1920	1917	1918	1919	1920	1917	1918	1919	1920
Births	60,982	63,213	61,493	66,010	27.55	28.30	26.94	28.58				
Still births as births	2,938	3,009	2,723	3,039								
Children born as twins	1,808	1,718	1,860	1,828								
Children born as triplets	42	51	21	9								
Illegitimate births	3,554	3,378	3,411	3,617					53.5	50.7	53.3	54.7
Deaths	31,739	44,083	31,613	30,652	14.34	19.73	13.85	13.27				
Still births as deaths	2,766	2,981	2,649	2,790								
Persons married	46,700	45,274	50,904	49,502	21.10	20.26	22.22	21.44				
Persons divorced		4,798	6,556	7,380		2.14	2.87	3.20				

TABLE III.

	Total No. of Births for 1920			Number of Children Born as Twins			Number of Children Born as Triplets			Number of Children Still-Born as Twins			Number of Children Still-Born as Triplets			Number of Illegitimate Births		
		White	Black	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black
State Total	** 66,010	45,308	20,700	1,828	1,192	636	9	3	6	78	34	44				3,617	887	2,730
Accomac	973	446	527	20	6	14										114	3	111
Charlottesville city	285	201	84	8	4	4				2		2				17	1	16
Albemarle	752	549	203	26	16	10				2		2				56	21	35
Clifton Forge city	175	147	28	2	2											5	2	3
Alleghany	490	412	78	10	10					2	2					20	11	9
Amelia	300	120	180	12	2	10										21	1	20
Amherst	545	365	180	26	14	12				2	2					16	6	10
Appomattox	248	169	79	14	6	8				2		2				8	1	7
Alexandria city	499	398	101	16	16					2		2				23	5	18
Arlington	324	255	69	8	6	2										13		13
Staunton city	193	152	41	12	10	2										12	7	5
Augusta	896	783	113	34	32	2										24	13	11
Bath	154	137	17													5	4	1
Bedford	840	612	228	18	16	2				2		2				34	5	29
Bland	178	176	2	2	2											2	2	
Botetourt	485	395	90	14	10	4				2	2					20	11	9
Brunswick	747	254	493	34	4	30										42	3	39
Buchanan	652	651	1	16	16											23	23	
Buckingham	445	213	232	20	8	12				4	2	2				38	3	35
Lynchburg city	907	687	220	18	10	8				2		2				63	18	45
Campbell	709	480	229	12	8	4										22	2	20
Caroline	470	187	283	8	4	4										39	2	37
Carroll	641	637	4	14	14					2	2					10	9	1
Charles City	141	17	124	4		4										7		7
Charlotte	*542	281	260	16	8	8										26		26
Chesterfield	555	329	226	22	8	14				2	2					31	3	28
Clarke	186	136	50	4	4											12	4	8
Craig	101	98	3	4	2	2										3	3	
Culpeper	306	180	126	12	6	6										23		23
Cumberland	280	83	197	6		6										19	3	16
Dickenson	530	521	9	18	18											8	8	
Petersburg city	872	477	395	16	12	4										86	5	81
Dinwiddie	482	166	316	14	4	10				2		2				28	2	26
Elizabeth City	725	528	197	10	8	2										24	5	19
Essex	169	63	106	6		6				2	2					23	3	20
Fairfax	483	361	122	20	16	4										17	6	11

Fauquier	494	321	173	8	6	2										24	6	18
Floyd	393	372	21	14	12	2										8	3	5
Fluvanna	213	112	101	4	2	2										19	3	16
Franklin	775	649	126	22	22											22	11	11
Winchester city	178	155	23	8	6	2				2	2					15	8	7
Frederick	221	214	7	10	10											5	4	1
Giles	348	324	24	4	4					2	2					10	5	5
Gloucester	320	170	150	10	2	8										8	2	6
Goochland	240	109	131	4	2	2										13	1	12
Grayson	608	580	28	24	24											19	12	7
Greene	214	187	27	6	6					2	2					13	9	4
Greensville	412	133	279	12	2	10										34		34
Halifax	1,432	721	711	34	14	20	3	3		4		4				81	5	76
Hanover	496	286	209	16	8	8										28	3	25
Richmond city	4,211	2,809	1,399	98	46	52										427	146	281
Henrico	407	247	164	10	4	6				2		2				14	1	13
Henry	684	402	282	16	12	4										27	1	26
Highland	126	122	4	4	4											8	7	1
Isle of Wight	387	164	223	12	2	10										24		24
James City	141	59	82	6	2	4										7		7
King George	150	76	74	8		8										12	1	11
King and Queen	281	104	177	16	14	2										20		20
King William	229	83	146	2		2										25		25
Lancaster	253	104	149	4	2	2										14		14
Lee	956	937	19	32	32											32	30	2
Loudoun	510	360	150	16	10	6				2	2					32	10	22
Louisa	433	224	209	18	6	12				2	2					28	2	26
Lunenburg	548	259	289	12	4	8										31	2	29
Madison	223	160	63	6	6					2		2				15	7	8
Mathews	144	95	49	2		2										12		12
Mecklenburg	1,106	433	673	34	14	20				4		4				78	4	74
Middlesex	197	96	101	6	6											10	1	9
Radford city	163	144	19	4	4											4	2	2
Montgomery	505	448	57	10	10											11	8	3
Nansemond	867	285	582	32	14	18				2		2				80	3	77
Nelson	569	404	165	18	14	4										32	5	27
New Kent	120	34	86	2		2										6	1	5
Norfolk city	2,869	1,837	1,032	70	44	26				4		4				208	27	181
Portsmouth city	1,399	773	626	20	6	14				2		2				85	3	82
Norfolk county	1,401	770	631	46	24	22				2		2				100	3	97
Northampton	432	153	279	8	2	6										26	1	25
Northumberland	343	174	169	12	8	4										19	3	16
Nottoway	411	200	211	8	6	2										36	1	35
Orange	340	200	140	6	2	4										27	4	23
Page	463	438	25	6	2	4										24	21	3
Patrick	*580	528	51	14	10	4										8	4	4
Danville city	577	460	117	14	8	6				2	2					26	12	14
Pittsylvania	2,029	1,324	705	54	32	22				4	2	2				76	9	67
Powhatan	187	54	133	8	2	6										20	1	19
Prince Edward	383	133	250	14	4	10										36	3	33
Prince George	403	228	175	10	6	4										29	1	28

TABLE III—CONTINUED.

	Total No. of Births for 1920			Number of Children Born as Twins			Number of Children Born as Triplets			Number of Children Still Born as Twins			Number of Children Still-Born as Triplets			Number of Illegitimate Births		
		White	Black	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black
Prince William	299	221	78	6	4	2	......	......	......	......	......	......	......	......	......	9	1	8
Princess Anne	311	115	196	6	2	4	......	......	......	......	......	......	......	......	......	19	......	19
Pulaski	532	454	78	12	8	4	......	......	......	......	......	......	......	......	......	24	9	15
Rappahannock	218	151	67	8	2	6	......	......	......	......	......	......	......	......	......	13	2	11
Richmond county	212	120	92	10	6	4	......	......	......	......	......	......	......	......	......	17	1	16
Roanoke city	1,534	1,281	253	46	42	4	......	......	......	2	2	......	......	......	......	86	34	52
Roanoke county	656	583	73	20	18	2	......	......	......	......	......	......	......	......	......	11	6	5
Buena Vista city	145	140	5	8	8	......	......	......	......	......	......	......	......	......	......	6	4	2
Rockbridge	543	491	52	20	18	2	......	......	......	......	......	......	......	......	......	27	20	7
Rockingham	988	938	50	28	26	2	......	......	......	......	......	......	......	......	......	52	38	14
Russell	1,048	1,014	34	28	26	2	......	......	......	......	......	......	......	......	......	28	23	5
Scott	831	829	2	22	22	......	......	......	......	......	......	......	......	......	......	22	21	1
Shenandoah	561	555	6	14	14	......	......	......	......	......	......	......	......	......	......	25	25	......
Smyth	739	719	20	24	24	......	......	......	......	2	2	......	......	......	......	29	24	5
Southampton	969	286	683	16	2	14	......	......	......	......	......	......	......	......	......	78	2	76
Fredericksburg city	206	157	49	6	6	......	......	......	......	......	......	......	......	......	......	13	2	11
Spotsylvania	248	162	86	8	6	2	......	......	......	2	......	2	......	......	......	10	2	8
Stafford	217	168	49	4	4	......	3	......	3	......	......	......	......	......	......	5	1	4
Surry	295	101	194	4	2	2	......	......	......	2	......	2	......	......	......	22	......	22
Sussex	408	114	294	6	......	6	3	......	3	......	......	......	......	......	......	35	1	34
Tazewell	890	833	57	26	26	......	......	......	......	......	......	......	......	......	......	18	13	5
Warren	239	195	44	4	4	......	......	......	......	......	......	......	......	......	......	11	8	3
Newport News city	742	428	314	12	6	6	......	......	......	......	......	......	......	......	......	37	1	36
Warwick	252	147	105	6	4	2	......	......	......	......	......	......	......	......	......	5	1	4
Bristol city	203	180	23	10	10	......	......	......	......	......	......	......	......	......	......	3	1	2
Washington	1,022	969	53	32	26	6	......	......	......	......	......	......	......	......	......	20	13	7
Westmoreland	295	135	160	8	4	4	......	......	......	......	......	......	......	......	......	35	1	34
Wise	1,898	1,808	90	66	56	10	......	......	......	2	2	......	......	......	......	33	29	4
Wythe	623	575	48	30	24	6	......	......	......	......	......	......	......	......	......	17	13	4
York	235	121	114	8	8	......	......	......	......	......	......	......	......	......	......	5	......	5

*1Color unknown.
**2Color unknown.

TABLE III—CONTINUED.

	Number of Illegitimate Children Born as Twins			Number of Illegitimate Children Born as Triplets			Number of Illegitimate Children Still-Born			Number of Illegitimate Children Still-Born as Twins			Number of Illegitimate Children Still-Born as Triplets			Number of Still-Births as Births		
	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black
State Total	58	14	44				321	39	282	8		8				3,039	1,453	1,586
Accomac							7		7							57	26	31
Charlottesville city							2		2							38	23	15
Albemarle							1		1							17	8	9
Clifton Forge city																4	3	1
Alleghany							2		2							22	17	5
Amelia							4		4	2		2				17	7	10
Amherst							1		1							24	7	17
Appomattox							1		1							12	4	8
Alexandria city	2	2					2		2							26	13	13
Arlington							1		1							19	13	6
Staunton city																7	7	
Augusta							2	2								20	18	2
Bath																5	5	
Bedford	2		2				3	1	2							39	26	13
Bland							1	1								8	8	
Botetourt																7	6	1
Brunswick	2		2				2		2							44	12	32
Buchanan																17	17	
Buckingham							1		1							22	10	12
Lynchburg city	2		2				8		8							43	17	26
Campbell							4	1	3							29	12	17
Caroline							3		3							10	1	9
Carroll							1	1								21	21	
Charles City							1		1							5		5
Charlotte							2		2							14	2	12
Chesterfield							2	1	1							24	10	14
Clarke							2		2							8	5	3
Craig																2	2	
Culpeper							1		1							9	2	7
Cumberland							2		2							10	2	8
Dickenson																8	8	
Petersburg city	2		2				14	1	13	2		2				66	18	48
Dinwiddie	2		2													20	4	16
Elizabeth City	2	2					6		6							37	21	16
Essex	2		2				2	1	1							10	6	4
Fairfax																14	8	6

TABLE III—CONTINUED.

	Number of Illegitimate Children Born as Twins			Number of Illegitimate Children Born as Triplets			Number of Illegitimate Children Still-Born			Number of Illegitimate Children Still-Born as Twins			Number of Illegitimate Children Still-Born as Triplets			Number of Still-Births as Births		
	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black
Fauquier																19	11	8
Floyd							1		1							10	9	1
Fluvanna							1		1							7	2	5
Franklin							2		2							36	27	9
Winchester city																9	9	
Frederick																5	5	
Giles							1	1								11	11	
Gloucester							1		1							19	11	8
Goochland																12	5	7
Grayson																8	8	
Greene																9	9	
Greensville							5		5	2		2				27	3	24
Halifax	2		2				6		6							74	20	54
Hanover							4	1	3							31	12	19
Richmond city	6		6				32	4	28							220	104	116
Henrico	2		2													22	7	15
Henry							5		5							29	10	19
Highland																3	3	
Isle of Wight							2		2							19	8	11
James City																5	3	2
King George							2	2								6	2	4
King and Queen																5	2	3
King William							2		2							12	5	7
Lancaster							3		3							22	9	13
Lee																19	18	1
Loudoun	2		2				3		3							26	14	12
Louisa							1		1							24	9	15
Lunenburg							4		4							35	11	24
Madison	2	2														10	6	4
Mathews							1		1							6	3	3
Mecklenburg	2		2				2		2							54	18	36
Middlesex							1		1							5	2	3
Radford city																5	4	1
Montgomery							1		1							23	18	5
Nansemond	2		2				8		8							58	14	44
Nelson	2		2				2		2							16	9	7
New Kent							3		3							8		8
Norfolk city	2		2				33	1	32							207	61	146
Portsmouth city							18		18	2		2				106	32	74

Norfolk county	2		2				10		10							81	27	54
Northampton							6		6							24	5	19
Northumberland	2		2				3		3							18	3	15
Nottoway							2		2							21	6	15
Orange							1		1							10	8	2
Page							2	1	1							35	30	5
Patrick																13	9	4
Danville city							3	1	2							34	21	13
Pittsylvania	4		4				9	2	7							112	56	56
Powhatan							2		2							22	3	19
Prince Edward							5	2	3							34	5	29
Prince George							2		2							29	11	18
Prince William																12	6	6
Princess Anne							2		2							22	8	14
Pulaski							1	1								18	15	3
Rappahannock	2		2													6	4	2
Richmond county							3		3							14	5	9
Roanoke city							4		4							85	63	22
Roanoke county							1		1							11	8	3
Buena Vista city																2	2	
Rockbridge	2	2					1		1							16	10	6
Rockingham	2	2					3	2	1							35	31	4
Russell																31	30	1
Scott							1	1								17	17	
Shenandoah	2	2														12	12	
Smyth																18	16	2
Southampton	2		2				7		7							40	4	36
Fredericksburg city							1	1								8	5	3
Spotsylvania							1	1								11	3	8
Stafford							2	1	1							5	1	4
Surry							2		2							25	6	19
Sussex							4		4							23	1	22
Tazewell	2	2					1	1								35	34	1
Warren																7	4	3
Newport News city							10		10							61	19	42
Warwick																4		4
Bristol city																8	6	2
Washington							3	3								26	1	25
Westmoreland							2	1	1							14	6	8
Wise							4	3	1							56	48	8
Wythe							1		1							18	16	2
York																9	5	4

*Color unknown.   1 Indian still-born in King William county.

TABLE IV.

Births, Deaths Under 1 *Year Age, and Infant Mortality Rates for Years* 1917, 1918, 1919, *and* 1920.

	TOTAL BIRTHS				DEATHS UNDER 1 YEAR				DEATHS UNDER 1 YEAR TO 1,000 LIVING BIRTHS			
	1917	1918	1919	1920	1917	1918	1919	1920	1917	1918	1919	1920
State total	60,859	63,213	61,493	66,010	5,941	6,491	5,533	5,511	97	102	90	83
Accomac	912	912	948	973	106	105	121	127	116	115	128	130
Charlottesville city	217	235	229	285	32	24	23	18	147	102	100	63
Albemarle	714	788	675	752	71	76	64	39	99	96	95	52
Clifton Forge city	120	130	148	175	10	12	8	13	83	92	54	74
Alleghany	470	455	436	490	28	36	45	48	59	79	103	98
Amelia	255	279	271	300	22	25	20	21	86	89	74	70
Amherst	497	493	481	545	33	43	39	44	66	87	81	81
Appomattox	265	279	270	248	24	19	16	26	90	68	59	105
Alexandria city	359	394	492	499	42	70	38	60	117	177	77	120
Arlington	216	228	259	324	28	20	17	35	129	87	66	108
Staunton city	176	159	172	193	16	12	17	23	90	75	99	119
Augusta	883	927	866	896	90	73	72	60	101	78	83	67
Bath	173	181	139	154	14	19	18	10	81	105	129	65
Bedford	887	836	832	840	65	68	55	46	73	81	66	55
Bland	166	180	148	178	10	11	12	8	60	61	81	45
Botetourt	434	476	427	485	29	34	32	38	67	71	75	78
Brunswick	695	690	686	747	67	66	46	51	96	95	67	68
Buchanan	670	716	649	652	66	76	54	78	98	106	83	120
Buckingham	412	429	423	445	36	32	42	33	87	74	99	74
Lynchburg city	739	759	760	907	84	79	68	65	113	104	89	72
Campbell	591	632	626	709	44	58	68	62	74	91	109	87
Caroline	486	484	477	470	48	32	38	24	98	66	80	51
Carroll	704	698	710	641	51	33	36	27	72	47	52	42
Charles City	151	171	149	141	20	13	12	10	132	76	81	71
Charlotte	469	514	451	*542	33	34	22	37	70	66	49	68
Chesterfield	495	468	540	555	64	50	48	49	129	106	89	88
Clarke	216	206	152	186	21	24	11	17	97	116	72	91
Craig	98	104	99	101	9	3	2	11	91	28	20	109
Culpeper	324	302	310	306	23	25	17	12	71	83	55	39
Cumberland	188	269	194	280	22	31	27	26	117	115	139	93
Dickenson	433	440	463	530	13	40	28	31	30	90	60	58
Petersburg city	898	957	870	872	166	155	118	125	185	163	136	143
Dinwiddie	479	486	491	482	48	53	44	40	100	109	90	83
Elizabeth City	425	471	485	725	43	80	50	50	101	169	103	69
Essex	208	192	183	169	20	13	16	5	96	67	87	30
Fairfax	385	399	376	483	36	44	29	34	93	110	77	70
Fauquier	559	533	496	494	50	38	41	27	89	71	83	55
Floyd	475	400	374	393	32	27	19	21	67	67	51	53
Fluvanna	205	216	202	213	17	15	19	20	82	69	94	94
Franklin	778	896	809	775	53	46	84	44	68	51	104	57
Winchester city	151	152	141	178	13	19	11	14	86	125	78	79
Frederick	274	254	223	221	33	19	18	7	120	74	81	32
Giles	418	415	366	348	29	33	38	38	69	79	104	109
Gloucester	295	284	258	320	25	22	12	17	84	77	47	53
Goochland	205	277	226	240	24	24	19	15	117	86	84	63
Grayson	641	595	580	608	48	36	39	46	75	60	67	76
Greene	193	208	171	214	36	21	24	12	186	101	140	56
Greensville	354	385	363	412	43	44	33	21	121	114	91	51
Halifax	1,262	1,378	1,303	1,432	107	134	121	111	84	97	93	78
Hanover	503	534	480	496	43	47	30	47	85	88	63	95
Richmond city	3,783	3,836	3,980	4,211	516	563	416	479	136	146	105	114
Henrico	446	451	422	407	36	43	53	45	80	95	126	111
Henry	561	626	619	684	40	53	54	60	71	84	87	88
Highland	152	128	146	126	15	7	15	8	98	54	103	63
Isle of Wight	409	415	377	387	49	42	40	41	120	101	106	106
James City	134	154	139	141	21	17	16	14	156	110	115	99
King George	134	162	143	150	18	13	15	7	134	80	105	47
King and Queen	276	260	214	281	28	25	15	23	101	96	70	82
King William	246	260	260	229	37	35	33	14	150	134	127	61
Lancaster	259	222	233	253	34	24	17	23	131	108	73	91
Lee	978	956	810	956	82	91	64	62	84	95	79	65
Loudoun	513	519	424	510	42	45	31	41	81	87	73	80
Louisa	462	467	467	433	46	35	37	33	99	75	79	76
Lunenburg	485	504	476	548	29	33	40	41	60	65	84	75
Madison	221	235	215	223	15	7	9	18	67	29	42	81
Mathews	184	152	160	144	15	16	13	14	81	105	82	97
Mecklenburg	999	986	989	1,106	66	99	69	86	66	100	70	79

TABLE IV—CONTINUED.

	TOTAL BIRTHS				DEATHS UNDER 1 YEAR				DEATHS UNDER 1 YEAR TO 1,000 LIVING BIRTHS			
	1917	1918	1919	1920	1917	1918	1919	1920	1917	1918	1919	1920
Middlesex....	232	178	189	197	21	25	12	14	90	140	63	71
Radford city...........	149	143	130	163	10	15	7	8	67	105	54	49
Montgomery...........	534	506	483	505	59	35	38	36	110	69	79	71
Nansemond....	709	813	803	867	71	58	69	75	100	71	86	87
Nelson................	514	523	453	569	43	31	52	44	83	59	94	77
New Kent..............	134	107	126	120	11	14	13	4	82	130	103	33
Norfolk city............	2,120	2,435	2,800	2,869	238	337	299	288	112	138	107	101
Portsmouth city........	833	944	1,245	1,399	91	137	125	145	109	145	100	104
Norfolk county.........	1,291	1,292	1,341	1,401	181	179	127	142	140	132	95	101
Northampton....	491	435	414	432	54	71	57	47	110	163	138	109
Northumberland..	327	345	346	343	46	49	34	38	140	142	98	111
Nottoway..............	315	343	392	411	26	33	37	28	82	96	94	68
Orange.................	291	324	300	340	15	15	23	21	51	46	77	62
Page..................	417	444	395	463	45	51	44	31	108	115	111	67
Patrick................	603	619	555	*580	33	37	47	20	54	59	85	34
Danville city...........	493	457	484	577	58	77	56	50	117	168	116	87
Pittsylvania............	1,672	1,906	1,771	2,029	169	158	117	137	101	84	66	68
Powhatan..............	180	186	168	187	25	18	13	18	139	96	77	96
Prince Edward.........	371	404	364	383	31	30	33	24	83	74	91	63
Prince George..........	759	824	416	403	73	137	43	31	96	166	103	77
Prince William.........	278	280	302	299	32	21	19	25	115	110	63	84
Princess Anne..........	346	312	355	311	39	46	24	31	112	147	68	100
Pulaski................	517	510	471	532	41	67	41	48	79	131	87	90
Rappahannock.........	224	244	201	218	24	21	21	24	107	86	104	110
Richmond county......	212	221	195	212	22	19	29	15	103	86	149	71
Roanoke city...........	1,230	1,249	1,834	1,534	136	154	120	153	110	123	90	100
Roanoke county........	589	642	634	656	46	54	44	46	78	84	69	70
Buena Vista city.......	114	112	111	145	11	14	9	16	96	125	81	110
Rockbridge............	562	600	538	543	32	46	50	40	57	76	93	74
Rockingham...........	939	1,022	906	988	83	86	95	86	88	84	105	87
Russell................	960	955	951	1,048	60	78	74	86	62	81	78	82
Scott.....	859	856	798	831	58	65	63	67	67	76	79	81
Shenandoah...........	514	578	482	561	31	43	33	29	60	74	68	52
Smyth.................	754	711	731	739	48	64	77	55	63	90	105	74
Southampton....... ...	896	889	835	969	99	91	79	75	110	102	95	77
Fredericksburg city....	134	145	148	206	16	24	25	14	119	165	169	68
Spotsylvania...........	253	302	262	248	17	27	16	13	67	87	61	52
Stafford...............	219	225	192	217	21	11	14	13	96	49	73	60
Surry..................	345	330	293	295	30	34	22	33	87	103	75	112
Sussex.................	434	394	389	408	53	34	42	37	122	86	108	91
Tazewell...............	911	966	851	890	68	94	54	69	74	97	63	98
Warren................	214	255	239	239	29	21	19	15	135	82	79	63
Newport News city.....	505	652	828	742	85	137	105	97	168	210	127	131
Warwick...............	135	93	141	252	21	17	20	16	155	183	142	63
Bristol city............	118	119	165	203	23	26	20	19	195	218	121	94
Washington...........	1,047	1,047	1,023	1,022	68	80	68	77	65	76	66	75
Westmoreland..........	235	267	248	295	25	37	36	16	106	138	145	54
Wise..................	1,724	1.942	1,895	1,898	177	219	180	170	102	113	95	90
Wythe.................	606	635	621	623	54	52	46	49	89	82	74	79
York..................	185	233	226	235	16	32	24	24	86	137	106	102

*1 color unknown.

TABLE VI.

Deaths from Important Causes and Death Rates per 100,000 Population in Virginia by Years.

	1913		1914		1915		1916		1917		1918		1919		1920	
	Total Deaths	Rate	Total Deaths	Rate	Total Deaths	Rate	Total Deaths	Rate	Total Deaths	Rate	Total Deaths	Rate	Total Deaths	Rate	Total Deaths	Rate
Typhoid	709	33.3	586	27.3	514	23.4	550	24.8	465	20.8	402	18.0	357	15.6	260	11.2
Malaria	152	7.1	169	7.9	153	7.0	145	6.5	123	5.5	81	3.8	69	3.0	51	2.2
Measles	363	17.1	116	5.4	58	2.6	407	18.3	347	16.0	277	14.0	74	3.2	94	4.3
Scarlet fever	55	2.6	38	1.8	24	1.1	29	1.3	17	0.8	23	1.1	34	1.5	32	1.3
Whooping cough	282	13.2	680	31.6	318	14.5	440	19.8	495	22.1	719	31.8	291	12.7	463	20.0
Diphtheria and croup	302	14.2	340	15.8	374	17.1	316	14.2	221	9.9	216	9.7	278	12.1	334	14.4
Influenza	286	13.4	261	12.1	411	18.7	730	32.9	464	20.7	7,839	420.2	3,858	168.2	2,311	100.0
Tuberculosis of lungs	3,184	149.6	3,478	161.8	3,608	164.5	3,436	154.9	3,383	151.6	3,728	168.2	3,132	136.5	2,994	129.6
Other forms of tuberculosis	407	23.7	436	20.2	395	18.1	446	20.3	410	18.5	365	16.9	313	13.7	325	14.0
Meningitis	281	13.2	243	11.3	248	11.3	210	9.5	204	9.7	281	11.8	214	9.3	177	7.6
Bronchitis	346	16.3	308	14.3	316	14.4	318	14.3	266	11.9	267	12.0	237	10.3	214	9.2
Pneumonia	1,412	82.4	1,636	75.6	1,867	85.9	1,972	89.9	1,948	88.0	3,271	146.4	1,523	66.7	1,596	69.1
Broncho-pneumonia	513	29.9	642	29.8	599	27.5	793	36.1	820	37.0	841	37.6	755	33.1	806	34.9
Diarrhea (under 2 years)	1,469	69.0	1,258	58.5	1,203	54.9	1,450	65.4	1,461	65.1	1,351	59.8	1,216	53.0	948	41.0
Diarrhea (over 2 years)	387	22.6	330	15.3	352	16.2	368	16.7	416	18.7	421	18.8	358	15.6	312	13.5
Congenital debility and malformations	1,544	72.5	1,909	88.8	1,885	86.0	1,865	84.1	1,900	84.7	1,994	88.2	1,757	76.6	1.992	86.2
Violent deaths (suicide excepted)	1,775	83.4	1,835	85.3	1,804	82.3	1,853	83.5	1,701	77.1	1,831	84.7	1,708	74.5	1,756	76.0
Suicides	143	6.7	155	7.2	183	8.3	179	8.1	131	6.1	163	8.3	174	7.6	128	5.5
Puerperal septicemia	144	6.8	179	8.3	161	7.3	168	7.6	191	8.5	163	7.2	127	5.5	149	6.4
Other puerperal affections	264	12.4	308	14.3	308	14.0	299	13.5	306	13.6	512	22.9	375	16.3	420	18.1
Pellagra	165	7.7	250	11.6	332	15.2	248	11.3	302	13.6	327	14.6	177	7.7	134	5.8

TABLE VII.

Comparative Table Showing Number of Persons Married for Years 1918-1919-1920.

	Number of Persons Married for Year Ending December 31, 1918.				Number of Persons Married for Year Ending December 31, 1919.				Number of Persons Married for Year Ending December 31, 1920.			
	Total	White	Colored	Color Not Stated	Total	White	Colored	Color Not Stated	Total	White	Colored	Color Not Stated
State total	45,274	26,668	18,606	....	50,904	30,119	20,131	654	49,502	30,612	18,870	20
Accomac	416	204	212	....	482	200	282	....	558	250	308	....
Charlottesville city	228	146	82	....	260	156	104	....	270	182	88	....
Albemarle	414	260	154	....	482	344	138	....	472	314	158	....
Clifton Forge city	90	60	30	....	118	72	46	....	152	102	50	....
Alleghany	228	160	68	....	334	242	92	....	376	296	80	....
Amelia	114	26	88	....	136	70	66	....	148	76	72	....
Amherst	266	154	112	....	356	202	(a) 154	....	330	206	(a) 124	....
Appomattox	134	86	48	....	160	88	72	....	124	86	38	....
Alexandria city	2,024	1,462	562	....	2,060	1,496	564	....	2,010	1,516	494	....
Arlington	292	220	72	....	334	248	86	....	418	302	110	6
Staunton city	160	110	50	....	222	154	68	....	212	164	48	....
Augusta	418	368	50	....	572	486	86	....	618	524	94	....
Bath	78	64	14	....	132	100	32	....	110	88	22	....
Bedford	338	222	116	....	432	306	126	....	450	290	160	....
Bland	54	52	2	....	124	122	2	....	100	96	4	....
Botetourt	194	150	44	....	280	226	54	....	236	202	34	....
Brunswick	244	46	198	....	310	104	206	....	364	104	260	....
Buchanan	234	234	....	....	420	420	....	....	346	346	....	....
Buckingham	180	88	92	....	238	108	128	2	298	120	178	....
Lynchburg city	792	500	292	....	1,050	660	390	....	1,220	846	374	....
Campbell	338	198	140	....	456	282	174	....	392	230	162	....
Caroline	160	64	96	....	202	68	134	....	170	78	92	....
Carroll	218	216	2	....	390	384	6	....	340	338	2	....
Charles City	72	10	62	....	102	16	86	....	94	20	74	....
Charlotte	226	112	114	....	262	130	132	....	330	156	174	....
Chesterfield	258	182	76	....	294	194	100	....	270	168	102	....
Clarke	44	26	18	....	66	44	22	....	106	62	44	....
Craig	54	46	8	....	54	54	....	....	92	88	4	....
Culpeper	140	78	62	....	146	86	60	....	196	120	76	....
Cumberland	146	50	96	....	152	48	104	....	172	44	126	2
Dickenson	248	236	12	....	348	....	....	348	338	326	12	....
Petersburg city	2,352	1,446	906	....	1,266	610	652	4	1,088	544	544	....
Dinwiddie	238	80	158	....	260	84	176	....	256	84	172	....
Elizabeth City	950	474	476	....	856	434	422	....	754	320	434	....
Essex	106	38	68	....	104	40	64	....	96	28	68	....

TABLE VII—CONTINUED.

	NUMBER OF PERSONS MARRIED FOR YEAR ENDING DECEMBER 31, 1918.				NUMBER OF PERSONS MARRIED FOR YEAR ENDING DECEMBER 31, 1919.				NUMBER OF PERSONS MARRIED FOR YEAR ENDING DECEMBER 31, 1920.			
	Total	White	Colored	Color Not Stated	Total	White	Colored	Color Not Stated	Total	White	Colored	Color Not Stated
Fairfax	136	112	24	....	210	172	38	....	204	172	32	....
Fauquier	192	114	78	....	232	152	80	....	256	172	84	....
Floyd	158	152	6	....	244	240	4	....	242	242	....	....
Fluvanna	120	74	46	....	92	54	38	....	108	52	56	....
Franklin	400	298	102	....	508	402	106	....	500	394	106	....
Winchester city	114	94	20	....	138	118	20	....	208	190	18	....
Frederick	144	138	6	....	218	210	8	....	220	208	12	....
Giles	144	130	14	....	178	172	6	....	218	206	12	....
Gloucester	122	72	50	....	160	100	60	....	218	124	94	....
Goochland	108	32	76	....	106	36	70	....	120	42	78	....
Grayson	216	198	18	....	364	328	14	22	266	256	10	....
Greene	74	64	10	....	118	102	16	....	114	94	20	....
Greensville	234	52	182	....	268	62	206	....	246	74	172	....
Halifax	602	226	376	....	994	436	(b) 558	....	784	354	(b) 430	....
Hanover	180	108	72	....	200	118	82	....	252	140	112	....
Richmond city	4,702	2,638	(a) 2,064	....	5,168	2,814	2,354	....	4,852	2,826	(c) 2,026	....
Henrico	232	128	104	....	246	142	104	....	262	140	122	....
Henry	236	120	116	....	436	220	216	....	408	236	172	....
Highland	46	42	4	....	64	64	....	....	78	74	4	....
Isle of Wight	170	62	108	....	244	112	132	....	290	134	156	....
James City	176	122	54	....	150	92	58	....	96	44	52	....
King George	58	32	26	....	72	32	40	....	90	42	48	....
King and Queen	122	48	74	....	146	58	88	....	118	48	70	....
King William	92	52	(b) 40	....	136	53	(c)(c1) 83	....	110	28	(d) 82	....
Lancaster	154	72	82	....	166	68	98	....	180	74	106	....
Lee	290	262	28	....	378	228	10	140	434	410	16	8
Loudoun	170	118	52	....	154	110	44	....	222	132	90	....
Louisa	190	96	94	....	222	118	104	....	220	112	108	....
Lunenburg	210	76	134	....	262	114	148	....	266	114	152	....
Madison	116	70	46	....	132	106	26	....	144	106	38	....
Mathews	90	64	26	....	124	100	24	....	122	78	44	....
Mecklenburg	376	82	294	....	554	158	396	....	532	196	336	....
Middlesex	90	34	56	....	136	58	78	....	108	54	54	....
Radford city	76	48	28	....	106	70	36	....	126	98	28	....
Montgomery	242	196	46	....	272	238	34	....	300	268	32	....
Nansemond	696	218	478	....	744	246	498	....	742	264	478	....
Nelson	242	148	94	....	278	200	78	....	236	108	78	....
New Kent	46	12	34	....	38	16	22	....	66	12	54	....
Norfolk city	4,836	2,334	2,502	....	4,848	2,474	2,374	....	3,990	2,130	1,860	....

Portsmouth city	1,414	628	786	....	1,770	696	1,074	....	1,716	738	(e) 978	....
Norfolk county	1,226	374	852	....	1,204	466	736	2	1,174	478	692	4
Northampton	322	94	228	....	336	94	242	....	336	116	220	....
Northumberland	152	74	78	....	150	70	80	....	136	72	64	....
Nottoway	224	114	110	....	216	90	126	....	248	106	142	....
Orange	180	112	68	....	212	144	68	....	174	114	60	....
Page	142	120	22	....	206	178	28	....	226	212	14	....
Patrick	238	222	16	....	326	300	26	....	344	296	48	....
Danville city	910	508	402	....	1,276	694	582	....	1,264	800	464	....
Pittsylvania	770	438	332	....	1,078	620	458	....	922	524	398	....
Powhatan	72	16	56	....	84	20	64	....	88	24	64	....
Prince Edward	230	80	150	....	292	106	186	....	284	94	190	....
Prince George	810	478	332	....	322	174	148	....	268	142	126	....
Prince William	150	120	30	....	140	108	32	....	158	130	28	....
Princess Anne	150	58	92	....	180	68	112	....	182	84	98	....
Pulaski	244	198	46	....	270	216	54	....	298	246	52	....
Rappahannock	64	50	14	....	100	68	32	....	124	86	38	....
Richmond county	98	58	40	....	112	68	44	....	106	48	58	....
Roanoke city	1,022	684	338	....	1,208	822	386	....	1,458	1,078	380	....
Roanoke county	362	292	70	....	500	406	94	....	524	400	124	....
Buena Vista city	58	46	12	....	84	78	6	....	82	64	18	....
Rockbridge	250	208	42	....	310	266	44	....	350	306	44	....
Rockingham	400	364	36	....	472	444	28	....	502	468	34	....
Russell	408	354	54	....	564	502	62	....	582	532	50	....
Scott	308	306	2	....	470	468	2	....	404	394	10	....
Shenandoah	214	212	2	....	230	226	4	....	288	282	6	....
Smyth	176	166	10	....	306	290	16	....	258	234	24	....
Southampton	406	146	260	....	452	128	324	....	480	150	330	....
Fredericksburg city	206	160	46	....	186	142	42	2	202	164	38	....
Spotsylvania	72	52	20	....	86	72	14	....	106	56	50	....
Stafford	80	62	18	....	110	80	30	....	96	80	16	....
Surry	180	56	124	....	158	38	120	....	180	56	124	....
Sussex	192	46	146	....	194	38	156	....	208	50	158	....
Tazewell	466	334	132	....	658	456	70	132	586	490	96	....
Warren	90	72	18	....	132	100	32	....	130	110	20	....
Newport News city	1,968	1.170	798	....	1,438	608	(d) 830	....	1,112	444	668	....
Warwick	78	30	48	....	146	84	62	....	160	80	80	....
Bristol city	206	164	42	....	230	180	50	....	220	144	76	....
Washington	166	148	18	....	198	182	16	....	120	112	8	....
Westmoreland	110	50	60	....	118	50	68	....	142	56	86	....
Wise	1,040	724	316	....	1,268	976	290	2	1,320	1,006	314	....
Wythe	254	214	40	....	374	336	38	....	326	266	60	....
York	116	60	56	....	172	96	76	....	164	66	98	....

(a)—Husband Indian—Wife Indian.
(b)—Husband Indian—Wife Indian.

(a)—6 Indians—(3 Indian couples)
(b)—4 Indians—(2 Indian couples).
(c)—2 Indians—(1 Indian couple).
(c1)—Husband White—Wife Indian.
(d)—2 Chinese—(1 Chinese couple).

(a)—2 Indians—(1 Indian couple).
(b)—4 Indians—(2 Indian couples).
(c)—2 Indians—(1 Indian couple).
(d)—4 Indians—(2 Indian couples).
(e)—2 Philippinos—(1 Philippino couple).

TABLE VIII.

Comparative Table Showing Number of Persons Divorced for Years 1918-1919-1920.

	Number of Persons Divorced for the Year Ending December 31, 1918.				Number of Persons Divorced for the Year Ending December 31, 1919.				Number of Persons Divorced for the Year Ending December 31, 1920.			
	Total	White	Colored	Color Not Stated	Total	White	Colored	Color Not Stated	Total	White	Colored	Color Not Stated
State total	4,798	1,664	1,290	1,844	6,556	2,738	2,030	1,788	7,380	3,764	2,268	1,348
Accomac	44	24	20	....	100	54	42	4	72	38	34	....
Charlottesville city	38	24	12	2	48	26	12	10	28	16	2	10
Albemarle	34	24	10	....	44	22	22	....	44	22	20	2
Clifton Forge city	10	6	4	....	20	12	8	....	8	4	4	....
Alleghany	32	22	10	....	54	36	18	....	38	28	8	2
Amelia	18	4	14	....	14	....	14	....	8	2	6	....
Amherst	40	16	20	4	36	12	24	....	24	12	10	2
Appomattox	6	....	6	....	18	6	12	....	12	8	4	....
Alexandria city	204	128	10	66	376	214	112	50	862	588	172	102
Arlington	182	....	....	182	260	170	88	2	342	242	98	2
Staunton city	18	10	6	2	32	20	12	....	42	20	20	2
Augusta	64	44	18	2	56	44	10	2	16	14	2	....
Bath	16	14	2	....	28	12	16	....	12	4	8	....
Bedford	30	8	14	8	30	2	....	28	38	8	8	22
Bland	None	None	None	None	6	6	....	....	8	8	....	....
Botetourt	22	12	10	....	18	16	2	....	24	16	6	2
Brunswick	26	2	24	....	48	6	42	....	30	4	26	....
Buchanan	16	16	....	....	64	64	....	....	44	44	....	....
Buchingham	14	10	4	....	22	4	18	....	30	6	24	....
Lynchburg city	114	26	22	66	144	44	44	56	162	54	44	64
Campbell	58	22	34	2	16	6	8	2	28	8	10	10
Caroline	30	6	22	2	32	4	28	....	44	6	38	....
Carroll	14	14	....	....	8	8	....	....	12	12	....	....
Charles City	4	2	2	....	6	....	6	....	8	2	6	....
Charlotte	16	4	12	....	10	2	8	....	28	6	22	....
Chesterfield	14	6	8	....	18	14	4	....	40	30	10	....
Clarke	6	4	2	....	6	6	....	....	18	10	8	....
Craig	2	2	....	....	None	None	None	None	8	6	2	....
Culpeper	8	2	6	....	20	16	4	....	28	14	14	....
Cumberland	16	....	16	....	24	2	22	....	34	....	34	....
Dickenson	6	6	....	....	12	12	....	....	20	20	....	....
Petersburg	118	12	4	102	132	66	66	....	108	32	36	40
Dinwiddie	8	2	6	....	10	....	10	....	12	2	10	....
Elizabeth City	116	28	62	26	118	34	82	2	148	58	90	....

Essex	4		4		10	2	8		4		4	
Fairfax	42	34	6	2	92	64	16	12	104	84	12	8
Fauquier	34	10	10	14	26	6	10	10	46	14	20	12
Floyd	8	6	2		6	6			16	14	2	
Fluvanna	10	4	6		6	4	2		16	10	6	
Franklin	22	18	4		30	26	4		26	22	4	
Winchester City	18	14	2	2	26	18	6	2	26	16	6	4
Frederick	14	14			14	14			16	14	2	
Giles	4	4			26	22	4		14	14		
Gloucester	22	10	12		18	4	14		26	16	10	
Goochland	12		12		4		4		8		8	
Grayson	20	18	2		64	62	2		38	38		
Greene	6	6			16	8	8		2	2		
Greensville	26	6	18	2	34	8	26		10		10	
Halifax	88	8	34	46	56	12	44		12	8	4	
Hanover	6		6		22	8	14		10	4	2	4
Richmond city	774	28	36	710	1,090	78	54	958	1,112	224	176	712
Henrico	12	8	4		22	14	2	6	36	18	16	2
Henry	14	2	12		26	6	18	2	30	16	14	
Highland	2	2			4	4			2	2		
Isle of Wight	10	4	2	4	6	2	4		26	12	14	
James City	4		4		14	6	8		14	4	10	
King George	18	8	10		10	4	6		22	6	16	
King and Queen	4		4		6		6		12	2	10	
King William	10	4	6		24	(a) 7	(a) 17		18	4	(a) 14	
Lancaster	12	4	8		10		10		20	4	16	
Lee	30	30			46	32		14	50	46		4
Loudoun	12	8	4		26	12	14		30	16	12	2
Louisa	22	4	18		20	8	12		16	6	6	4
Lunenburg	20	4	16		26	14	12		32	2	30	
Madison	4	2	2		8	4	4		14	6	8	
Mathews	4		4		4	4			16	2	14	
Mecklenburg	42		8	34	92	4	88		40	4	34	2
Middlesex	16		16		36	10	26		32	10	22	
Radford city	16	8	8		10	6	4		6	2	4	
Montgomery	12	12			16	10	6		8	8		
Nansemond	36	4	28	4	40	6	34		56	12	44	
Nelson	18	12	6		16	8	8		16	6	10	
New Kent	None	None	None	None	10	4	6		2		2	
Norfolk city	366	158	130	78	454	(b) 219	(b) 169	66	654	420	208	26
Portsmouth city	132	68	58	6	180	(c) 67	(c) 67	46	212	84	106	22
Norfolk county	104	26	42	36	94	48	28	18	64	38	22	4
Northampton	34	12	22		64	16	48		54	18	30	6
Northumberland	6	4	2		12	2	10		2	2		
Nottoway	10	2	8		12	4	8		18	6	12	
Orange	18	8	10		12	4	8		22	16	6	
Page	6	6			26	20	6		12	12		
Patrick	12	12			24	12	12		28	26	2	
Danville city	48	28	20		138	(d) 45	(d) 63	30	174	76	46	52
Pittsylvania	122	62	60		144	68	70	6	144	86	58	
Powhatan	6	4	2		6	4	2		6	2	4	

TABLE VIII—CONTINUED.

	NUMBER OF PERSONS DIVORCED FOR THE YEAR ENDING DECEMBER 31, 1918.				NUMBER OF PERSONS DIVORCED FOR THE YEAR ENDING DECEMBER 31, 1919.				NUMBER OF PERSONS DIVORCED FOR THE YEAR ENDING DECEMBER 31, 1920.			
	Total	White	Colored	Color Not Stated	Total	White	Colored	Color Not Stated	Total	White	Colored	Color Not Stated
Prince Edward	26	4	22	....	50	20	30	....	40	8	32	....
Prince George	62	42	18	2	44	36	8	....	16	14	2	....
Prince William	12	10	....	2	14	6	2	6	44	26	10	8
Princess Anne	22	6	16	....	20	8	12	....	24	4	20	....
Pulaski	20	14	6	....	40	26	14	....	46	30	16	....
Rappahannock	2	2	....	....	16	6	10	....	4	....	4	....
Richmond county	6	4	2	....	14	4	10	....	4	4	....	....
Roanoke city	200	44	24	132	226	134	64	28	262	172	44	46
Roanoke county	30	24	6	....	24	18	6	....	36	22	14	....
Buena Vista city	8	8	....	....	2	2	....	....	10	8	2	....
Rockbridge	30	18	12	....	24	22	2	....	40	30	10	....
Rockingham	8	8	....	....	16	16	....	....	22	16	6	....
Russell	58	50	6	2	60	58	2	....	64	64	....	....
Scott	30	20	10	....	52	50	....	2	40	40	....	....
Shenandoah	14	14	....	....	14	14	....	....	32	32	....	....
Smyth	48	38	4	6	42	40	....	2	52	46	2	4
Southampton	16	....	16	....	20	6	14	....	28	6	22	....
Fredericksburg city	12	12	....	....	26	22	4	....	26	18	8	....
Spotsylvania	12	2	10	....	20	14	6	....	16	6	10	....
Stafford	6	2	2	2	16	6	2	8	14	14	....	....
Surry	14	4	10	....	14	6	8	....	40	10	30	....
Sussex	8	....	8	....	12	....	12	....	44	6	38	....
Tazewell	42	32	8	2	46	36	10	....	66	52	14	....
Warren	22	20	2	....	22	22	....	....	16	12	4	....
Newport News city	188	10	10	168	246	....	2	244	226	50	42	134
Warwick	16	....	16	....	50	6	42	2	68	12	52	4
Bristol city	46	26	12	8	54	48	6	....	48	44	4	....
Washington	42	32	8	2	78	64	14	....	54	48	4	2
Westmoreland	12	4	8	....	20	14	6	....	16	8	6	2
Wise	116	....	....	116	210	42	....	168	178	140	14	24
Wythe	26	22	4	....	46	34	12	....	28	20	8	....
York	8	6	2	....	10	2	6	2	22	4	18	....

(a)—Husband Indian—Wife White.
(b)—Husband White—Wife Colored.
(c)—Husband Philippino—Wife White.
(d)—Husband Chinese—Wife White.

(a)—Husband Indian—Wife Indian.

6
8
0
0
.5
6
9
33
11
00
68
40
75
.31
.29
.63

atio of

State

Accomac.
Charlotte
Albemarl
Clifton F
Alleghany
Amelia..
Amherst
Appoma
Alexand
Arlingto
Staunto
August
Bath..
Bedfor
Bland.
Boteto
Bruns
Bucha
Bucki
Lync
Camp
Caro
Carr
Cha
Cha
Che
Cla
Cra
Cu
Cu
Di
Pe
D
E
E
F
F
I

TABLE X.

Ratio of Divorces to Marriages by Counties and Cities for 1918-1919-1920.

	1918			1919			1920		
	Number of Marriages	Number of Divorces	Number of Marriages to Each Divorce	Number of Marriages	Number of Divorces	Number of Marriages to Each Divorce	Number of Marriages	Number of Divorces	Number of Marriages to Each Divorce
State total	22,637	2,399	9.44	25,452	3,278	7.76	24,751	3,690	6.71
Accomac	208	22	9.45	241	50	4.82	279	36	7.75
Charlottesville city	114	19	6.00	130	24	5.42	135	14	9.64
Albemarle	207	17	12.18	241	22	10.95	236	22	10.73
Clifton Forge city	45	5	9.00	59	10	5.90	76	4	19.00
Alleghany	114	16	7.13	167	27	6.19	188	19	9.89
Amelia	57	9	6.33	68	7	9.71	74	4	18.50
Amherst	133	20	6.65	178	18	9.89	165	12	13.75
Appomattox	67	3	22.33	80	9	8.89	62	6	10.33
Alexandria city	1,012	102	9.92	1,030	188	5.48	1,005	431	2.33
Arlington	146	91	1.60	167	130	1.28	209	171	1.22
Staunton city	80	9	8.89	111	16	6.94	106	21	5.05
Augusta	209	32	6.53	286	28	10.21	309	8	38.63
Bath	39	8	4.88	66	14	4.71	55	6	9.17
Bedford	169	15	11.27	216	15	14.40	225	19	11.84
Bland	27	None	....	62	3	20.67	50	4	12.50
Botetourt	97	11	8.82	140	9	15.56	118	12	9.83
Brunswick	122	13	9.38	155	24	6.46	182	15	12.13
Buchanan	117	8	14.63	210	32	6.56	173	22	7.86
Buckingham	90	7	12.86	119	11	10.82	149	15	9.93
Lynchburg city	396	57	6.95	525	72	7.29	610	81	7.53
Campbell	169	29	5.83	228	8	28.50	196	14	14.00
Caroline	80	15	5.33	101	16	6.31	85	22	3.86
Carroll	109	7	15.57	195	4	48.75	170	6	28.33
Charles City	36	2	18.00	51	3	17.00	47	4	11.75
Charlotte	113	8	14.13	131	5	26.20	165	14	11.79
Chesterfield	129	7	18.43	147	9	16.33	135	20	6.75
Clarke	22	3	7.33	33	3	11.00	53	9	5.89
Craig	27	1	27.00	27	None	....	46	4	11.50
Culpeper	70	4	17.50	73	10	7.30	98	14	7.00
Cumberland	73	8	9.13	76	12	6.33	86	17	5.06
Dickenson	124	3	41.33	174	6	29.00	169	10	16.90
Petersburg city	1,176	59	19.93	633	66	9.59	544	54	10.07
Dinwiddie	119	4	29.75	130	5	26.00	128	6	21.33
Elizabeth City	475	58	8.19	428	59	7.25	377	74	5.10
Essex	53	2	26.50	52	5	10.40	48	2	24.00
Fairfax	68	21	3.24	105	46	2.28	102	52	1.96
Fauquier	96	17	5.65	116	13	8.92	128	23	5.57
Floyd	79	4	19.75	122	3	40.67	121	8	15.13
Fluvanna	60	5	12.00	46	3	15.33	54	8	6.75
Franklin	200	11	18.18	254	15	16.93	250	13	19.23
Winchester city	57	9	6.33	69	13	5.31	104	13	8.00
Frederick	72	7	10.29	109	7	15.57	110	8	13.75
Giles	72	2	36.00	89	13	6.85	109	7	15.57
Gloucester	61	11	5.55	80	9	8.89	109	13	8.38
Goochland	54	6	9.00	53	2	26.50	60	4	15.00
Grayson	108	10	10.80	182	32	5.69	133	19	7.00
Greene	37	3	12.33	59	8	7.38	57	1	57.00
Greensville	117	13	9.00	134	17	7.88	123	5	24.60
Halifax	301	44	6.84	497	28	17.75	392	6	65.33
Hanover	90	3	30.00	100	11	9.09	126	5	25.20
Richmond city	2,351	387	6.07	2,584	545	4.74	2,426	556	4.36
Henrico	116	6	19.33	123	11	11.18	131	18	7.28
Henry	118	7	16.86	218	13	16.77	204	15	13.60
Highland	23	1	23.00	32	2	16.00	39	1	39.00
Isle of Wight	85	5	17.00	122	3	40.67	145	13	11.15
James City	88	2	44.00	75	7	10.71	48	7	6.86
King George	29	9	3.22	36	5	7.20	45	11	4.09
King and Queen	61	2	30.50	73	3	24.33	59	6	9.83
King William	46	5	9.20	68	12	5.67	55	9	6.11
Lancaster	77	6	12.83	83	5	16.60	90	10	9.00
Lee	145	15	9.67	189	23	8.22	217	25	8.68
Loudoun	85	6	14.17	77	13	5.92	111	15	7.40
Louisa	95	11	8.64	111	10	11.10	110	8	13.75
Lunenburg	105	10	10.50	131	13	10.08	133	16	8.31
Madison	58	2	29.00	66	4	16.50	72	7	10.29
Mathews	45	2	22.50	62	2	31.00	61	8	7.63

TABLE X—CONTINUED.

	1918			1919			1920		
	Number of Marriages	Number of Divorces	Number of Marriages to Each Divorce	Number of Marriages	Number of Divorces	Number of Marriages to Each Divorce	Number of Marriages	Number of Divorces	Number of Marriages to Each Divorce
Mecklenburg	188	21	8.95	277	46	6.02	266	20	13.30
Middlesex	45	8	5.63	68	18	3.78	54	16	3.38
Radford city	38	8	4.75	53	5	10.60	63	3	21.00
Montgomery	121	6	20.17	136	8	17.00	150	4	37.50
Nansemond	348	18	19.33	372	20	18.60	371	28	13.25
Nelson	121	9	13.44	139	8	17.38	118	8	14.75
New Kent	23	None	....	19	5	3.80	33	1	33.00
Norfolk city	2,418	183	13.21	2,424	227	10.68	1,995	327	6.10
Portsmouth city	707	66	10.71	885	90	9.83	858	106	8.09
Norfolk county	613	52	11.79	602	47	12.81	587	32	18.34
Northampton	161	17	9.47	168	32	5.25	168	27	6.22
Northumberland	76	3	25.33	75	6	12.50	68	1	68.00
Nottoway	112	5	22.40	108	6	18.00	124	9	13.78
Orange	90	9	10.00	106	6	17.67	87	11	7.90
Page	71	3	23.67	103	13	7.92	113	6	18.83
Patrick	119	6	19.83	163	12	13.58	172	14	12.29
Danville city	455	24	18.96	638	69	9.25	632	87	7.26
Pittsylvania	385	61	6.31	539	72	7.49	461	72	6.40
Powhatan	36	3	12.00	42	3	14.00	44	3	14.67
Prince Edward	115	13	8.85	146	25	5.84	142	20	7.10
Prince George	405	31	13.06	161	22	7.32	134	8	16.75
Prince William	75	6	12.50	70	7	10.00	79	22	3.59
Princess Anne	75	11	6.82	90	10	9.00	91	12	7.58
Pulaski	122	10	12.20	135	20	6.75	149	23	6.48
Rappahannock	32	1	32.00	50	8	6.25	62	2	31.00
Richmond county	49	3	16.33	56	7	8.00	53	2	26.50
Roanoke city	511	100	5.11	604	113	5.35	729	131	5.56
Roanoke county	181	15	12.07	250	12	20.83	262	18	14.56
Buena Vista city	29	4	7.25	42	1	42.00	41	5	8.20
Rockbridge	125	15	8.33	155	12	12.92	175	20	8.75
Rockingham	200	4	50.00	236	8	29.50	251	11	22.82
Russell	204	29	7.03	282	30	9.40	291	32	9.09
Scott	154	15	10.27	235	26	9.04	202	20	10.10
Shenandoah	107	7	15.29	115	7	16.43	144	16	9.00
Smyth	88	24	3.67	153	21	7.29	129	26	4.96
Southampton	203	8	25.38	226	10	22.60	240	14	17.14
Fredericksburg city	103	6	17.17	93	13	7.15	101	13	7.77
Spotsylvania	36	6	6.00	43	10	4.30	53	8	6.63
Stafford	40	3	13.33	55	8	6.88	48	7	6.86
Surry	90	7	12.86	79	7	11.29	90	20	4.50
Sussex	96	4	24.00	97	6	16.17	104	22	4.73
Tazewell	233	21	11.10	329	23	14.30	293	33	8.88
Warren	45	11	4.09	66	11	6.00	65	8	8.13
Newport News city	984	94	10.47	719	123	5.85	556	113	4.92
Warwick	39	8	4.88	73	25	2.92	80	34	2.35
Bristol city	103	23	4.48	115	27	4.26	110	24	4.58
Washington	83	21	3.95	99	39	2.54	60	27	2.22
Westmoreland	55	6	9.17	59	10	5.90	71	8	8.88
Wise	520	58	8.97	634	105	6.04	660	89	7.42
Wythe	127	13	9.77	187	23	8.13	163	14	11.64
York	58	4	14.50	86	5	17.20	82	11	7.45

TABLE XI.

Showing Comparative Standing and Birth Rates of Counties and Cities for 1919–1920

Comparative Standing of Counties and Cities			Comparative Birth Rates			
			1919		1920	
1919	1920		Births	Rates	Births	Rates
		State total	61,493	26.94	66,010	28.58
50	60	Accomac	948	27.10	973	27.95
101	78	Charlottesville city	229	22.25	285	26 68
75	52	Albemarle	657	24.89	752	28.92
81	57	Clifton Forge city	148	24.27	175	28.39
37	23	Alleghany	436	28.66	490	31 96
6	35	Amelia	271	34.53	300	30.61
79	62	Amherst	481	24.40	545	27.56
32	76	Appomattox	270	29.28	248	26.78
44	61	Alexandria city	492	27.68	499	27.36
115	113	Arlington	259	16.76	324	20.20
116	115	Staunton city	172	16.19	193	18.17
71	88	Augusta	866	25.11	896	25.84
103	101	Bath	139	21.70	154	24.10
49	65	Bedford	832	27.23	840	27.40
55	24	Bland	148	26.67	178	31.81
66	47	Botetourt	427	25.61	485	29.30
8	9	Brunswick	686	32.90	747	35.53
1	1	Buchanan	649	42.89	652	42 22
38	41	Buckingham	423	28.37	445	29.91
67	38	Lynchburg city	760	25.41	907	30.16
85	79	Campbell	626	23.76	709	26.54
30	45	Caroline	477	29.79	470	29.47
3	39	Carroll	710	37.63	641	30.12
22	46	Charles City	149	30.79	141	29.41
64	30	Charlotte	451	25.98	542	30.90
59	67	Chesterfield	540	26.25	555	27.09
107	84	Clarke	152	21.12	186	25.96
83	96	Craig	99	23.79	101	24.63
90	104	Culpeper	310	23.29	306	23.02
106	32	Cumberland	194	21.27	280	30.73
5	3	Dickenson	463	35.34	530	39.14
35	59	Petersburg city	870	28.64	872	28.01
43	73	Dinwiddie	491	27.79	482	26.84
111	54	Elizabeth City	485	19.59	725	28.72
105	114	Essex	183	21.28	169	19.77
114	109	Fairfax	376	17.24	483	22.01
96	107	Fauquier	496	22.60	494	22.59
40	40	Floyd	374	28.31	393	29.96
87	93	Fluvanna	202	23.69	213	24.92
23	44	Franklin	809	30.76	775	29.49
109	87	Winchester city	141	20.78	178	25.85
113	116	Frederick	223	17.85	221	17.74
21	49	Giles	366	30.83	348	29.24
104	72	Gloucester	258	21.59	320	26.91
68	68	Goochland	226	25.38	240	27.07
33	33	Grayson	580	29.26	608	30.69
56	18	Greene	171	26.61	214	33.60
19	10	Greensville	363	31.21	412	35.51
15	15	Halifax	1,303	31.59	1,432	34.69
54	64	Hanover	480	26.68	496	27.43
84	97	Richmond city	3,980	23.79	4,211	24.53
102	112	Henrico	422	21.74	407	21.45
17	17	Henry	619	31.34	684	33.81
31	90	Highland	146	29.37	126	25.54
62	74	Isle of Wight	377	26.04	387	26.82
97	105	James City	139	22.57	141	22.96
94	83	King George	143	22.84	150	26.03
91	34	King and Queen	214	23.25	281	30.67
29	82	King William	260	30.82	229	26.18
108	86	Lancaster	233	20.84	253	25.93
11	5	Lee	810	32.21	956	37.80
110	94	Loudoun	424	20.55	510	24.79
48	92	Louisa	467	27.42	433	25.35
14	8	Lunenburg	476	31.71	548	35.91
100	103	Madison	215	22.29	223	23.23

TABLE XI—CONTINUED.

Comparative Standing of Counties and Cities			Comparative Birth Rates			
			1919		1920	
1919	1920		Births	Rates	Births	Rates
112	117	Mathews	160	18.83	144	17.04
12	11	Mecklenburg	989	31.92	1,106	35.44
93	100	Middlesex	189	22.97	197	24.15
39	12	Radford city	130	28.35	163	35.23
61	66	Montgomery	483	26.16	505	27.16
46	43	Nansemond	803	27.62	867	29.57
58	21	Nelson	453	26.29	569	32.94
45	80	New Kent	126	27.66	120	26.42
69	95	Norfolk city	2,800	25.24	2,869	24.79
82	89	Portsmouth city	1,254	23.80	1,399	25.72
88	98	Norfolk county	1,341	23.56	1,401	24.42
89	99	Northampton	414	23.34	432	24.20
27	42	Northumberland	346	30.24	343	29.79
42	51	Nottoway	392	28.03	411	29.02
98	91	Orange	300	22.50	340	25.52
53	28	Page	395	26.87	463	31.34
9	16	Patrick	555	32.87	580	34.42
95	75	Danville city	484	22.74	577	26.79
13	7	Pittsylvania	1,771	31.72	2,029	35.92
65	55	Powhatan	168	25.80	187	28.54
76	85	Prince Edward	364	24.74	383	25.94
25	58	Prince George	416	30.45	403	28.16
99	110	Prince William	302	22.38	299	21.88
57	106	Princess Anne	355	26.47	311	22.83
47	29	Pulaski	471	25.51	532	31.09
74	69	Pappahannock	201	24.91	218	27.01
60	56	Richmond county	195	26 23	212	28.51
51	36	Roanoke city	1,334	27.08	1,534	30.17
36	48	Roanoke county	634	28.67	656	29.30
34	6	Buena Vista city	111	28.87	145	37.06
63	81	Rockbridge	538	26.01	543	26.33
72	63	Rockingham	906	24.96	988	27.50
4	4	Russell	951	35.95	1,048	39.13
10	19	Scott	798	32.33	831	33.54
92	71	Shenandoah	482	23.15	561	26.97
7	20	Smyth	731	33.32	739	33.40
26	13	Southampton	835	30.44	969	35.17
70	14	Fredericksburg city	148	25.17	206	35.02
73	102	Spotsylvania	262	24.95	248	23.46
86	77	Stafford	192	23.69	217	26.76
18	26	Surry	293	31.33	295	31.69
28	25	Sussex	389	30.13	408	31.79
20	22	Tazewell	851	30.89	890	31.96
52	70	Warren	239	27.07	239	27.00
80	111	Newport News city	828	24.31	742	20.84
117	108	Warwick	141	12.96	252	22.09
77	37	Bristol city	165	24.68	203	30.17
16	27	Washington	1,023	31.55	1,022	31.57
78	53	Westmoreland	248	24.45	295	28.81
2	2	Wise	1,895	41.86	1,898	40.82
24	31	Wythe	621	30.69	623	30.82
41	50	York	226	28.18	235	29.21

TABLE XII.

Transcripts Issued September, 1920, to September, 1921.

Transcripts Issued Free of Charge Found in New Records.

	Births	Deaths
Pension and compensation	60	10
War Department		1
American Red Cross	34	21
War Risk Insurance	4	13
Allotment	4	
Child Labor	1	
Child Welfare	1	
Public Welfare		1
To enter school	1	
Piedmont Sanitorium		3
Miscellaneous	1	
Total	106	49

Searches Made Free of Charge in New Records, but Not Found on File.

	Births	Deaths
Pension and compensation	3	
War Department	4	
American Red Cross	4	2
Child Welfare	1	
Treasury Department	1	
Total	13	2

Searches Made in New Records but Not Found on File: 10 births and 17 deaths.

Transcripts Issued Free of Charge Under Act of 1918 Found in Old Records 1853 Through 1896 and Divorce Records 1917 to Present Date.

	Marriages	Divorces	Births	Deaths
American Red Cross	28	3	3	
Pension	1		2	2
Associated Charities			1	
Total	29	3	6	2

Searches Made Free of Charge in Old Records 1853 Through 1896 but Not on File.

	Marriages	Births	Deaths
American Red Cross		2	
Pension	1	1	1
Associated Charities	2		
Department of Justice		1	
War Risk Insurance		1	
Passport Control		1	
Total	3	6	1

	Marriages	Births	Deaths	Divorces
Searches made and not paid for but on file in old records	4	11		
Searches made and not paid for and not on file in old records and new divorces	2	30	4	1
Total	6	41	4	1

Transcripts Issued for Fees for the State Treasury.

Births, 165; deaths, 197; still births, 2; as deaths, 1; total, 465	$ 232 50
For searches made for which no transcripts were issued	6 00
Delayed fees for previous year	5 00
Total	$ 243 50
For searching old marriage, birth and death records and new divorce records and transcripts for same	43 00
Total	$ 286 50
Interest on bank deposit	1 92
Total	$ 288 42

Annual Report of the Director Bureau of Child Welfare.

For year Ending September 30, 1921.

PERSONNEL.

Director	Dr. Mary Evelyn Brydon
Director Division Public Health Nursing	Mrs. Fereba B. Croxton
Red Cross Supervising Nurse	Miss Blanche W. Webb
Director Division Mouth Hygiene	Dr. N. Talley Ballou
Director Division Educational Hygiene	Miss Mary I. Bell
Field Nurse	Mrs. Agnes Russell Gay
Stenographer	Mrs. H. T. Merriman
Stenographer	Miss Willie E. Harmon
Stenographer	Miss Nannie Ellis
Stenographer	Miss Perle Farley

The changes in the personnel during the past year are as follows: Miss Blanche Webb resigned in April to study for a year in New York, and the office remained vacant until Miss Bettie W. McDanald assumed the duties of the acting Red Cross supervising nurse from August 1st to September 15th. Miss Emily Heard, who was appointed Red Cross supervising nurse of Virginia to take her place, entered upon her work September 15th. Mrs. F. B. Croxton resigned as director of the division of public health nursing in August, and Miss Nannie C. Minor, who has directed the instructive visiting nurses' work in Richmond for many years, was appointed as her successor. Miss Minor enters the office October 1st. Miss McDanald was the acting State supervising nurse during August and half of September.

Dr. E. J. Applewhite, who had been appointed to conduct an oral hygiene survey in the State, concluded his work in November, 1920. Following the action of the Board approving Dr. Applewhite's report and his recommendation that a division of mouth hygiene be created in the Bureau of Child Welfare, Dr. N. Talley Ballou, of Portsmouth, was appointed to take charge of this work and entered the office April 15, 1921.

On December 1, 1920, Miss Mary I. Bell, librarian and instructor in hygiene for ten years in the State Normal School for Women, Harrisonburg, Virginia, was appointed director of a correspondence course for teachers in school hygiene.

Mrs. Nancy V. McComb, the field nurse, was given nine months' leave of absence for post-graduate work in Washington, and Mrs. A. R. Gay has substituted for her, assuming the duties of the field nurse March 1, 1921.

SCOPE OF THE WORK.

Distinct progress was made during the past year in school hygiene work along all lines already determined by this department. Both the State Board of Education and the State Board of Health, recognizing the fact that in order to educate children successfully, to reduce the proportion of failures, to abolish illiteracy in Virginia, and to make good citizens of the children, it is absolutely essential that they be physically fit to use to the best advantage the opportunities afforded them.

To see that the child is physically fit is the function of the State Board of Health; to educate him is the function of the State Department of Education. With these ends in view, these two departments have co-operated in working out a joint program in a most sympathetic and practical manner.

The West law prescribes definite work in regard to the health of school children and indicates clearly the provinces of the departments in administering the law:

(a) The teachers shall be instructed in the fundamentals of safeguarding the health of their pupils; and no certificate allowing them to teach shall be granted by the Department of Education after 1925 without proof of having received this instruction.

(b) The pupil shall receive an annual health examination to determine his physical fitness.

(c) Any physical defects thus brought to light should be corrected; and since the logical persons to encourage correction are the public health nurses, it is proper that the employment of such auxiliaries to education should be aided by means of financial assistance to counties employing them.

(d) After the children have had their physical defects corrected, they shall be returned to school to receive health education and physical education as a part of their course of study.

This program is carried out by the following means:

(a) 1. Health instruction for prospective teachers at normal schools and other teacher-training institutions under the joint supervision of the State Board of Health and the State Board of Education.

2. Establishment of a correspondence course in physical inspection and school hygiene conducted by the State Board of Health and the State Board of Education.

(b) Requirement of physical inspection of all pupils by the teachers within three weeks after the opening of the school; the individual reports of these inspections sent to the parents and to the county nurse, where there is one; tabulated reports sent by the superintendent to the State Board of Health and the State Board of Education.

(c) 1. Promotion and supervision of public health nursing by the Board of Health, especial emphasis being laid upon supervision of health work in the public schools.

2. Promotion and supervision of correctional clinics in the rural districts by the State Board of Health for the purpose of correcting

the physical defects brought out by the inspection. These include at this present stage of development:

a. Dental clinics.

b. Adenoid and tonsil clinics.

3. Financial aid to assist counties in establishing nursing services and correctional clinics by the State Board of Health.

(d) 1. Supervision of instruction in physical education of prospective teachers in normal schools and other institutions having teacher training by the State Board of Education.

2. (a) Supervision of physical education in the grades by the State Board of Education.

(b) Financial aid to assist counties in establishing physical education directors in the schools by the State Board of Education.

3. Promotion of health leagues among school children in the public schools by the State Board of Health.

EDUCATIONAL HYGIENE.

The education of teachers in physical inspection of school children and school hygiene may be looked upon as one of the most important works of this Bureau. If the future responsible father or mother citizen is to be a healthy individual with the problem before him of training youth in safeguarding health, the child of today needs intensive training in health habits. It is a fallacious pedagogical philosophy to say that talking long enough, hard enough and emphatically enough will teach the child anything in the way of habits that will be a permanent asset in his life. The practical application of health to the individual life must come through training in acts that will become habits to the extent of being unconscious and automatic. The thoughtful teacher has long known that the usual methods of teaching hygene have been so futile that unnecessary and preventable sickness and deaths continue to devastate the child and adult world. Therefore, when the public mind began to bestir itself and ask for new methods, most teachers were found to be in an adaptable mood, ready to fall in with the part of the program for health betterment providing special training for teachers in the matter of safeguarding the health of the pupils.

There are thirty-six institutions in the State whose diplomas are recognized by the State Board of Education as exchangeable certificates to teach. As reported last year, plans were made by this bureau and endorsed by the Board of Education for training all prospective teachers in these schools and colleges in health work as regards the school child. The course in its early stage of development proved inadequate for this purpose, and during the past year efforts were made to raise the course in physical inspection and school hygiene to the standard demanded by educational institutions for all their credit courses. Thus this course was raised from a small special five to ten-hour course to a thirty-six hour or a one-session hour course, and every effort made by each one of the teacher-training schools and colleges to offer it to all prospective teacher students.

It remains for this bureau to submit to the Board of Education the subject matter which shall be covered in the course. Tentative outlines have been offered covering:

Physical inspection of school children.
Community hygiene or contagious diseases and their control.
Personal and social hygiene.
Accidents and emergencies.
Hygiene of instruction.
Care of school plant.
Health of the teacher.

Report of the Correspondence Course in Physical Inspection and School Hygiene.

I herewith submit the report of the correspondence course for the period of its existence, from December 2, 1920, to September 30, 1921.

This course is the product of the apparently impossible requirement of the West law that before 1925 all of Virginia's 14,000 teachers shall offer proof of having passed a course in school hygiene and physical inspection of school children. The State Board of Education and the State Board of Health arranged to have this course given at the normal schools and other teacher-training institutions during both the winter and the summer sessions, but as many teachers cannot attend these schools it was necessary to devise some means of meeting their needs in this direction.

Instruction by correspondence has been proved successful by many educational institutions, notably the universities of Chicago and Wisconsin, so it was decided by the two boards to make the experiment here. A director was chosen; a stenographer was provided to assist with the clerical work; an outline of the course of twelve lessons was agreed upon; regulations adopted; *The Health Manual for Teachers* was rewritten with the assistance of specialists in the various subjects discussed; and the work regularly begun on December 2, 1920.

Each lesson was first submitted to the Health Commissioner for criticism, then to a specialist in the subject; some were entirely the work of the specialist. In such a limited number of lessons, it was of course impossible to do full justice to the subject, but it will be admitted that the following titles cover the "high places" of a working knowledge of health education required by the average teacher: Vision and hearing; teeth; adenoids and tonsils; communicable diseases (2); control of child's environment; physical education (2); accidents and emergencies; the teacher's health; methods of teaching hygiene. The lessons require actual work with the children and their surroundings and a report of this work as a part of the written lessons. They are carefully corrected not only in respect to subject matter, but also in respect to English composition, spelling, and punctuation and the grading includes all of these. In this way it is hoped to make the course of genuine and general educative value.

This work has been successful from the start, both in the number enrolled and in the painstaking interest shown by the students. The enrollment now consists of 600 teachers, of whom about one-third are colored. Eighty-three counties of the State are represented, and requests for enrollment have come from six States outside of Virginia. One hundred and seven teachers have completed the course and received certificates. Many others have nearly completed it, but preferred to wait until the fall for the last lesson, as there is no time limit. The final grades have been remarkably good, due partly to the fact that any lesson not deserving a passing grade is returned to the writer to be tried again; sometimes this process has to be repeated, but the final result is uniformly good.

Many expressions of appreciation have been received from those who have completed the course, such as: "This course has really educated me over again in hygiene, and has given me a broader view of health education." "This course has helped me to understand my children better than I ever did before." "This course has helped me just as much, and I think is just as important as any I have ever taken. I have found the lessons very interesting, and I am glad I had the opportunity to take them."

We feel that this work has come to stay; that it is one of the best ways ever devised to spread the gospel of health and to put into practice the principles the State Board of Health wishes to inculcate. The number of lessons should be increased to thirty so as to cover more ground and at the same time raise the value of the credits given the course by the State Board of Education to the same status as those given for the professional courses in the teacher-training schools. At present, the twelve lessons are a credit only as a requirement for the first and second-grade certificates, and for the renewal of certificates.

If the enrollment continues to grow, as it doubtless will, it will be necessary to increase the personnel of the working force here at the office. The number of papers to be corrected will be of an impossible magnitude, if done with any degree of care, and upon this evidence of care, and of making each student feel that he or she is of special interest, depends the real success of the work.

The correspondence work is capable of expansion in other directions included in the activities of this bureau. A course for mothers, for home-makers, for members of the family who should know something of home nursing, are suggested as a few of the means for carrying useful and practical knowledge of essentials to those who cannot leave home to gain this knowledge. The State Board of Health has before it an extensive field for future development in this direction.

PHYSICAL INSPECTION OF SCHOOL CHILDREN.

The problem of inspecting school children for physical defects is in process of being solved in Virginia. Thoughtful people entertaining the big vision of making all people healthy will agree that before anything can be done to educate the people in disease prevention the matter has to be taken up from an individual rather than a group point of view. No one can hope to be healthy, or to co-operate with any well-rounded program for promoting his individual health, so long as his body is constantly fighting against health-destroying factors which are ever encroaching upon his reserve strength. The procedure of first finding the physical defects and having them corrected before attempting to educate the child, is therefore based upon the soundest logic.

The shortage of doctors is not the only reason for urging that the teacher be responsible for the health of the school child. It would seem at first glance that the doctor, and the doctor alone, should assume this responsibility, principally because he has a mind trained in all health matters. But this does not work out in practice where the field of operation is within the province of another profession. If there were enough doctors to spare, and they had unlimited time and opportunity, it might be the duty of this bureau to advise that every school be required to employ a school physician. But there are not enough doctors available for this work, and the few who are employed are only on part time and do not have opportunity to make a complete medical examination of the pupil. Public opinion cannot see at this stage of development any necessity for the doctors going into the schoolroom and stripping the child for an adequate medical examination. This should be done in the privacy of his office where he is surrounded by all the apparatus for doing his best work. His time in the school being limited, he can do no more than give the child a cursory inspection for obvious physical defects, and cannot get around to do that more than once in two or three years. He can do nothing in the way of aggressive health work; he has no time to supervise the teacher in that more important work—teaching hygiene and health habits; and, not being a trained teacher himself, would hardly know how to supervise it if he had the time. He rarely has time to address the children unless an epidemic occurs that requires his presence at a school oftener than his schedule calls for. It is vitally necessary to any adequate health program that every county have one whole-time health officer to conduct all health matters of a public nature. This county health officer should have no jurisdiction in school matters except in regard to epidemics and sanitation matters that are definitely pertinent to public welfare. All work of any educational nature, including health, should be under one educational director.

The school nurse, on the contrary, has a very distinct place in the school system; not as nurse, but as health supervisor. Many of the arguments that have been advanced against a doctor as a doctor entering the schoolroom, might be advanced against the nurse entering as a nurse. She is usually the only one to look after three or four thousand children, an impossible number within any circumstances to be responsible for, and especially where the schools are many miles apart and the work must be done during the season of bad roads and bad weather. The school nurse is invaluable as a health supervisor, whose work is not primarily to do the detail work in the schoolroom, such as physical inspection and instruction in the grades, but to instruct, to supervise, and to help the teachers in their health work, to assist in controlling epidemics, to be a link between home and school, to get corrections made and to send the child back in good condition to receive his mental, moral and health education. She must be a permanent institution in every community, and to be permanent she must be supported by public and not by private funds.

The teacher remains as the only logical person to undertake and to control health education in the schoolroom. The teacher has already assumed this duty and is carrying it through as prescribed by the joint Boards of Health and of Education. The teacher who has inspected the pupils according to this program has become definitely enrolled in the fight for better health in the community.

The program is much the same as last year. The teacher understands that this inspection is in no way a medical examination; but that it is only for the purpose of detecting obvious physical defects of eyes, ears, teeth; and to determine which children are undernourished by comparing their weight and height with an accepted standard scale. All teachers are consistently warned against attempting a diagnosis, and are urged to ask parents to send their children to the family physician when defects are reported. Some teachers in an excess of zeal may overstep this limit or disregard this warning; but this enthusiasm for health should be forgiven by the practitioner and the teacher instructed how better results may be secured by conforming to the instructions.

That the superintendents have been aroused to this need and are taking great interest in the health program, a study of the accompanying table will show. It reflects great credit upon them and their efforts to enforce the law. It is by no means to be considered a complete report of all the inspection that was done in rural Virginia last session. Many nurses and teachers, health officers and superintendents who undertook to carry it out were delayed in sending in their reports, so these counties did not receive the credit for the work they really accomplished. Approximately 400,709 children were enrolled in the rural schools during the session 1920-21. Of these 127,189 were reported inspected, or about one-third of the entire enrollment. Although the teachers who have received instruction in physical inspection in the teacher-training institutions in the State have been taught how to inspect for enlarged tonsils, this part of the inspection has not been required of them, as it is deemed too early yet in the history of the work for them to undertake it. Many teachers, however, have shown enthusiastic interest in the problem of the child who is backward as a result of adenoids and enlarged tonsils, and it is a matter of only a few years before they will insist on having their efforts recognized.

The State Superintendent of Public Instruction has this year made mandatory the physical inspection of school children early in the session, and the State Board of Health is assisting in the work by furnishing to teachers the material needed in this inspection.

The following tabulation shows the approximate amount of material sent to the division superintendents of schools during the school system 1920-21, to be used in the physical inspection of school children:

Physical Inspection Record Cards (High School)	Physical Inspection Record Cards (Grammar Grade)	Report Postal Cards	Notices to Parents	Eye Testing Cards (Lettered and for Illiterates)	Health Manual for Teachers
21,310	265,385	7,925	70,833	12,172	15,000

In addition to the above, physical inspection material and State Board of Health Bulletins were sent to all the summer normal schools and colleges to be used in giving the course in physical inspection and school hygiene.

COUNTIES	Enrollment 1920	Number Children Inspected	Defective Vision	Defective Hearing	Defective Teeth	Defective Tonsils *	Poor Nutrition
Accomac............a.......	9,052	302	65	20	194	x	25
Albemarle..................	5,993	5,037	(Physical	defects)			
			93	%			
Arlington..................	2,894	1,722	622	138	1,038	611	x
Alleghany...........a.......	3,532	1,702	21	5	180	x	4
Amelia.............a.......	2,352	57	6	14	14	x	10
Amherst....................	4,354	1,883	x	x	x	x	x
Appomattox.........a.......	2,309	20	4	5	6	x	x
Augusta....................	7,765	3,157	171	9	497	3	205
Bath...............a.......	1,431	1,106	163	159	586	x	224
Bedford............a.......	7,759	35	7	7	27	x	6
Bland......................	1,398	....	....	....	....	....	....
Botetourt..................	4,198	1,400	188	40	423	x	33
Brunswick..........a.......	5,776	1,488	380	145	896	x	152
Buchanan...........a.......	4,592	1,596	421	263	1,077	x	293
Buckingham.........a.......	3,487	131	10	x	5	x	x
Campbell...........a.......	6.573	505	x	x	x	x	x
Caroline...........a.......	4,003	359	81	30	197	x	38
Carroll....................	5,693	....	....	....	....	....	....
Charles City.......a.......	1,212	700	154	x	117	x	155
Charlotte..........a.......	3,991	20	2	x	13	x	x
Chesterfield...............	4,362	2,866	563	67	1,865	456	116
Clarke.....................	1,654	....	....	....	....	....	....
Craig..............a.......	829	828	213	45	452	x	15
Culpeper...........a.......	2,977	739	228	98	385	x	81
Cumberland.........a.......	1,779	216	74	4	67	x	7
Dickenson..........a.......	3,345	186	28	21	144	x	35
Dinwiddie..........a.......	4,160	2,263	443	114	1,202	x	1,007
Elizabeth City.............	3,980	315	28	3	120	29	17
Essex..............a.......	2,030	1,787	380	94	704	x	196
Fairfax............a.......	4,633	800	....	....	....	....	....
Fauquier...................	4,349	2,731	'(Physical	defects 1,	793)		
Floyd..............a.......	4,789	560	174	21	281	x	17
Fluvanna...................	1,951	101	34	....	19	x	2
Franklin...........a.......	7,135	1,750	488	147	1,201	x	114
Frederick..................	2,837	2,027	319	53	310	223	4
Giles......................	2,799	1,426	518	55	1,143	571	x
Gloucester.................	3,004	....	....	....	....	....	....
Goochland..................	2,061	754	17	8	402	220	140
Grayson....................	5,697	....	....	....	....	....	....
Greene.....................	1,650	....	....	....	....	....	....
Greensville................	3,122	1,669	588	169	919	x	160
Halifax....................	11,050	8,473	(4,849 wit	h defects)			
Hanover....................	3,928	2,727	89	5	1,360	111	x
Henrico....................	3,726	3,163	107	24	103	2	11
Henry......................	5,164	1,958	217	3	340	37	273
Highland...................	1,208	....	....	....	....	....	....
Isle of Wight......a.......	3,689	362	68	29	x	x	12
James City.........a.......	765	563	97	52	130	x	6
King and Queen.....a.......	1,946	1,168	411	116	737	x	157
King George................	1,260	....	....	....	....	....	....
King William.......a.......	2,071	126	31	18	51	x	28
Lancaster..........a.......	1,993	169	70	9	96	x	x
Lee........................	6,221	....	....	....	....	....	....
Loudoun....................	4,692	4,047	214	28	1,546	156	87
Louisa.............a.......	4,168	118	10	13	73	x	18
Lunenburg..........a.......	3,662	284	92	29	204	x	58
Madison............a.......	2,402	222	42	5	78	x	x
Mathews....................	1,631	....	....	....	....	....	....
Mecklenburg................	7,775	5,182	1,163	267	3,251	53	367
Middlesex..................	1,948	....	....	....	....	....	....
Montgomery.........a.......	4,357	1,778	278	90	1,226	x	42
Nansemond..................	4,312	3,554	419	42	1,431	223	27
Nelson.....................	3,987	....	....	....	....	....	....
New Kent...........a.......	938	524	122	26	253	x	35
Norfolk....................	9,156	7,681	128	95	478	7	21
Nottoway...........a.......	3,554	199	89	26	90	x	x
Northampton........a.......	4,172	850	196	40	327	x	33
Northumberland.....a.......	2,455	311	74	28	196	x	8
Orange.............a.......	2,825	93	38	9	2	x	18
Page.......................	3,420	....	....	....	....	....	....

COUNTIES	Enrollment 1920	Number Children Inspected	Defective Vision	Defective Hearing	Defective Teeth	Defective Tonsils *	Poor Nutrition
Patrick	5,371	2,451	592	69	1,696	105	x
Pittsylvania	13,998	9,669	1,581	307	2,991	x	1,386
Powhatan	1,222	....	....	....	....	....	....
Prince Edward	3,436	1,691	357	120	616	225	x
Prince George	2,958	121	x	x	x	110	x
Princess Anne	2,905	....	....	....	....	....	....
Prince William	2,823	....	....	....	....	....	....
Pulaski	3,970	....	....	....	....	....	....
Rappahannock ...... a	1,674	112	8	2	38	x	x
Richmond	1,528	....	....	....	....	....	....
Roanoke ...... a	5,365	2,428	452	96	1,493	157	23
Rockbridge	4,860	1,202	47	24	382	x	20
Rockingham ...... a	7,676	1,176	137	7	273	x	16
Russell	6,773	....	....	....	....	....	....
Scott	8,634	....	....	....	....	....	....
Shenandoah ...... a	4,753	1,676	x	x	x	x	x
Smyth	5,603	1,703	237	312	280	x	15
Southampton ...... a	6,682	1,656	525	153	974	x	26
Spotsylvania ...... a	2,227	1,883	718	68	1,090	x	18
Stafford	1,547	....	....	....	....	....	....
Surry ...... a	2,732	284	95	12	237	x	26
Sussex ...... a	3,136	240	91	16	160	x	47
Tazewell	6,591	2,430	317	33	1,242	31	107
Warren ...... a	1,830	108	27	12	89	x	5
Warwick	1,139	....	....	....	....	....	....
Washington ...... a	7,545	2,041	154	32	713	10	16
Westmoreland ...... a	2,175	582	65	18	187	84	73
Wise	11,384	1,246	(Defects	not given)			
Wythe	5,165	2,327	291	48	1,389	144	435
York	1,731	....	....	....	....	....	....
Total	400,769	127,187					

a. Inspection exclusively by teachers.
Other counties having inspection done by nurses, or under supervision of nurses.
* This year teachers were not instructed to examine tonsils. Next year this will be required.
x Indicates no report.

Extent of Physical Inspection of School Children and Correction of Defects, by Cities—Session 1920-21.

CITIES	Enrollment 1920-21	When Health Work	Number Doctors (part time)	Number School Nurses	Number Dentists (part time)	Number Children Inspected 1920-21	Number with Physical Defects	Number Defects Corrected
Alexandria	3,096	....	Whole time health officer	2	1 Whole time	1,694	....	665
Bristol	1,576	....	....	1	....	....	....	....
Buena Vista	928	1,920	....	1	....	722	601	110
Charlottesville	2,812	1,909	1	1	....	2,615	....	....
Clifton Forge	1,509	....	....	....	....	....	....	....
Danville	4,027	1,916	Health Officer	1	1	3,503	6,371	1,343
Fredericksburg	Report n	ot in						
Harrisonburg	1,538	....	....	....	....	....	....	....
Lynchburg	6,149	....	1	2	....	3,855	1,900	1,803
Newport News	6,057	1,916	....	2	....	2,962	1,690	1,002
Norfolk	17,024	1,914	6	7	....	16,712	8,130	4,403
Petersburg	5,551	1,915	....	2	4	1,254	....	....
Portsmouth	9,314	1,913	2	3	....	8,547	5,484	1,656
Radford	1,271	....	....	....	....	....	....	....
Richmond	31,520	1,911	4	11	3	15,117	6,746	9,771
Roanoke	11,153	....	....	....	....	....	....	....
Staunton	1,630	....	....	1	....	1,613	....	1,299
Suffolk	1,881	....	....	....	....	....	....	....
Williamsburg	444	....	....	....	....	....	....	....
Winchester	Report n	ot in						

COUNTIES RECEIVING STATE AID.

The policy followed in disbursing the West law fund was to allow it preferably to rural districts rather than to urban. The county making application for State aid is required to match dollar for dollar the amount applied for. The disbursement for any one county does not exceed $500 towards a school nurse's salary and $500 for correctional work, or a maximum of $1,000 per county. It is understood by the counties making application, that the school nurse or school clinician employed for this work is to give his or her entire time during the term of employment to health work among school children; that such nurse or clinician is to be approved by the State Board of Health and to work under its supervision; that regular quarterly report of work accomplished are to be made by the nurse and clinician, on prescribed blanks, to the State Board of Health; and that upon receipt and approval of these quarterly reports of work done and money expended, quarterly reimbursements are made to the division superintendent or other agent of the county school board. State aid for health work in the rural schools was allotted to thirty-two counties.

COUNTIES	Amount Allotted for Physical Inspection	Amount Allotted for Correctional Work	Total Amount Allotted
Amherst	$ 500 00		$ 500 00
Bath	500 00		500 00
Buchanan	500 00		500 00
Caroline	500 00		500 00
Craig	500 00		500 00
Essex		$ 250 00	250 00
Fairfax		250 00	250 00
Fauquier	500 00	500 00	1,000 00
Goochland	500 00		500 00
Greensville	500 00	250 00	750 00
Halifax		500 00	500 00
Hanover		300 00	300 00
Henry	500 00		500 00
Highland	500 00		500 00
Isle of Wight		600 00	600 00
Lancaster		500 00	[illegible]00 00
Mecklenburg		300 00	300 00
Montgomery		250 00	250 [illegible]
Nansemond	500 00		500 00
Northumberland		500 00	500 00
Princess Anne	500 00		500 00
Prince Edward	500 00		500 00
Prince George		85 00	85 00
Roanoke	500 00	250 00	750 00
Rockbridge	500 00	500 00	1,000 00
Shenandoah	500 00	189 07	689 07
Spotsylvania		500 00	500 00
Tazewell		350 00	350 00
Warren		300 00	300 00
Westmoreland		500 00	500 00
Wise	500 00	500 00	1,000 00
Wythe	500 00		500 00
Totals	$9,000 00	$7,374 00	$16,374 07

PLANS FOR DEVELOPMENT.

For the Pre-school Child.

Little or nothing is being done to encourage parents to see that the pre-school child is put in good physical condition before he enters school. In order that the parent may realize the need for assuming this responsibility child welfare clinics should be established in every county, either as permanent health centers or as educational conferences. It is frequently too late to begin setting up adequate health standards or habits in the child after he reaches school age. The time to establish individual physical fitness is during the early pre-school age.

For the Teacher's Health.

No definite program was followed in regard to promoting the health of the teacher during the past year, but the matter received some thoughtful consideration and more specific plans will be worked out during the coming year. Both in the revised health manual and the correspondence course this matter received special attention.

Report of State Supervising Nurse.

NEED OF THE BUREAU.

As the public health program is developed in the State, the necessity for public health nurses and nursing is becoming more and more apparent. In the beginning of public health nursing in the State emphasis was laid on inspection and follow-up work among school children by the nurses. Under the West law the major portion of the inspection of the school children passes into the hands of the teachers.

The increased number of inspections creates a correspondingly greater demand for nurses for the follow-up and correctional work. Inspection for defects without correction of defects creates an anomalous situation that is apparent to every one interested.

The logical person for developing this part of the program is the public health nurse. Report of what has already been accomplished along these lines is shown in these nurses' reports.

With the creation of the bureau of tuberculosis another responsibility is apparent. Cases are found through the diagnostic clinics, and obviously it is unwise to leave them unsupervised. Again we turn to the county nurse and ask her to add this activity to her program. Even though this doubles her work, she welcomes this opportunity for having an expert clinician diagnose doubtful and suspicious cases.

As the activities in the field multiply we see a corresponding increase in the work of the bureau and a greater need for its existence. It is very necessary to have a central bureau to tie up the various activities and act as a clearing house for the nurses in the field as well as the communities employing the nurses. Also it is necessary to have a bureau responsible for placing nurses in new fields.

AIM.

As the need for more workers in the field is demonstrated the desire to meet this need is created. The ultimate aim is to place a nurse or nurses in each of the one hundred counties in the State.

YEAR'S ACHIEVEMENT.

At the beginning of the year 1920-21 there were 160 nurses in the State carrying on public health nursing. At the close of the year, September 30, 1921, there are 166.

New assignments in towns and counties are as follows:

Town and County.	*Names of Nurses.*
Goochland county	Miss Juliet Scott
Salem	Miss Alice Powers
North Holston	Miss Hope Harris
Dinwiddie	Miss Jessie Steele
Buena Vista	Miss Audrey Drake
Greensville county	Miss Lucy Hamilton
Brunswick county	Miss Helen Brockway
Hot Springs	Miss Margaret Davis
Caroline county	Miss Lillian Gorton
Clarke county	Miss E. Caroline Johnson
Harrisonburg	Miss Evelyn Hill
Roanoke	Miss Sarah Earhart
Suffolk	Mrs. James Keesee
Halifax county	Beatrice Spencer
Fauquier county	Daisy Greene
Clinchfield	Miss Anne Calfee
Wise county	Miss Rachel McNiel
Marion	Miss Mildred Bethea

A nursing organization has been formed in each of these places. This organization has several committees, such as: executive, nursing, financial and publicity, which includes a representative from each organization or county board appropriating funds for this work and also a number of other interested people.

The nurses monthly reports show that a total of 63,247 children have received physical inspection by the nurse. 24,460 of these have 50,946 defects. 8.830 of these defects have been corrected. While correction of defects falls far below one hundred per cent, we must realize that few counties in the State have facilities affording opportunity for remedial treatment. This has led to the necessity of holding occasional local clinics at which the children needing treatment can be operated upon at a cost within their means; 1,465 children have received treatment at clinics of this type. The nurses have organized 568 health leagues in the schools with a total enrollment of 14,697 children. They have held 148 home-nursing classes with an enrollment of 1,793 students. 4.671 children have been vaccinated by the nurses and they have given 3,538 health talks.

The health leagues have proved a fascinating means of teaching personal hygiene and health habits to the school children. They develop initiative and personal responsibility in the children and give them an opportunity to learn the principles of leadership. The teachers and principals were delighted with the results obtained from these leagues. Quoting from several reports:

> "The health league teaches the children to protect themselves and others against diseases."
>
> "Education in sanitation and personal hygiene."
>
> "It has increased the school spirit fifty per cent and the children have carried the lesson of health into the homes."
>
> "Promotes cleanliness and neatness in classrooms, yards, and toilets."
>
> "Wonderful! They teach health, work, honesty, energy and will power."

ACTIVITIES.

Through the year this division has maintained supervision of the Metropolitan nursing service in the State.

A fee from fifty to sixty-five cents per visit is paid to each nursing organization whose nurses give nursing care to the Metropolitan policy holders. The funds from this source has made it possible for about twelve small towns to have nursing service.

The number of supervisory visits made and talks given by the State supervising nurse in connection with the Metropolitan work are as follows:

Towns and cities visited	32
Number of supervisory visits	38
Number of talks to agents	34

FOR PUBLICITY.

A bulletin, "The Public Health Nurse," describing the duties and activities of the public health nurse, was prepared and distributed through the State. This bulletin prepares the way for the nurse as it gives to the community a clear conception of what to expect of the nurse and what the community's responsibility is toward the nurse.

FIELD NOTES.

The nurses' news letter mentioned in the annual report of 1920 was of so much value to the nurses in the field that it finally developed into a larger and broader periodical now known as Field Notes. All field workers under the State Board of Health have a section in the Field Notes, which is issued periodically and distributed not only to the field workers, but to a number of citizens in each county. Much helpful information is given in these Notes. The State supervising nurse is responsible for the public health nursing section.

STATE UNIFORM FOR NURSES.

Realizing that a State uniform for public health nurses not only lends professional dignity to the work and to the nurse, but is also a protection to the nurse who must go into all communities, the State supervising nurse appointed a committee to decide on the kind and style of a uniform for the State. Samples of material and directions for making such a uniform have been sent to all public health nurses. It is hoped that all public health nurses will be wearing the State uniform by the first of the year.

As stated in the opening paragraph of this report emphasis in public health nursing heretofore has been laid on school nursing rather to the exclusion of other. types of public health nursing. For the introduction of public health work there is no better channel than school nursing, but since the public health nurse has become more or less a necessity and the communities have seen the value of her work, the time has come when other activities rank equally in importance.

INSTRUCTING AND SUPERVISING MIDWIVES.

Statistics show that there are six thousand (6,000) midwives practicing in Virginia. It also shows that 36.6 per cent of the babies delivered in Virginia are delivered by midwives. A large per cent of these midwives are women who are ignorant and dirty and have had no course in midwifery. All public health nurses are being urged to give a practical course in midwifery in their town or county and to keep midwives under supervision. An outline for such a course was compiled by the State supervising nurse and was sent to each nurse with a copy of a little book "Help for Midwives," written by Dr. Plecker, State Registrar. This book will be used as a text and reference book.

It is hoped this course for midwives will help to lessen the maternal and infant death rates, and will insure a more intelligent and safer service to mothers when attended by midwives. If an active program of midwife classes is carried on we should begin to see decided results by the end of the year.

One link in the child welfare work that has not received due attention is the prenatal care of the mother. The child's life begins not with birth but nine months earlier. The care that is given the expectant mother is a most important consideration. In the State in 1920 there were 5,762 still births and 5,521 infants lost their lives before they were one year old. Experience has shown that a large majority of these deaths occurred in the first month of life.

Dr. R. W. Lohenstein, in his report to the children's bureau conference in May and June, 1919, says, "The studies carried on by the Federal Children's Bureau, as well as by certain public and private organizations in this country, all strikingly reveal the fact that the nine months of intra-uterine life coupled with the first year after birth represent the high mark of danger in the life span of every individual. Every community should be aroused to the fact that the logical time to begin guarding infant life is not after birth, but rather in the earlier periods of development."

With properly organized clinics, there should result a reduction of from thirty to thirty-five per cent in the deaths under one year of age; a material lowering in the number of still births; a reduction in premature births of at least twenty-five per cent and in the material death rate of from 60 to 65 per cent below the general rate of unsupervised cases.

Active work of this sort, coupled with midwife supervision, should produce most gratifying results in lowering the death rate among infants and mothers in the State of Virginia.

STATISTICAL SUMMARY.

Total number of cities, towns and counties visited	79
Total number of supervising visits to nurses	54
Total number of health talks given	67
Total number of conferences attended	5
Total number of places stimulated to secure funds for county or town nurse	12
Total number of nurses placed	17
Total number of public health nursing associations organized	8

PLANS FOR ENSUING YEAR.

The State supervising nurse having resigned August 15th, and her successor not having assumed charge before the end of the present year, September 30th, plans for the ensuing year do not form a part of this report.

FINANCIAL REQUIREMENTS.

In the last eighteen months there were twenty-five counties that applied for and received State aid for the support of county public health nursing. It is believed that these counties should be encouraged to continue this valuable service and the best way to encourage them is to continue the financial assistance heretofore given to these twenty-five counties. This alone would require $12,500. This amount is needed merely to maintain the services already in existence and which from a public health point of view it would be most unfortunate to discontinue.

If the nursing service is to be expanded to meet the need, we should plan to add not fewer than ten new services to these already established, requiring $5,000 in addition to the $12,500 mentioned above, making a total of $17,500.

During the past year a considerable number of the nursing services have been promoted and financed by the Red Cross. It is felt that a large number of the chapters will have difficulty in raising funds by the roll call for the ensuing year, thus necessitating additional help from the State. A sum of $2,500 should be reserved for this emergency.

This being the case, it is estimated that the smallest sum under which the division can operate with any degree of success would be $20,000, to be used as follows:

For services already established and receiving State aid	$12,500
For inaugurating new services	5,000
For services maintained by private funds which will doubtless prove inadequate	2,500
Total	$20,000

REPORT OF RED CROSS SUPERVISING NURSE.

In accordance with the policy of the Red Cross in inaugurating nursing services in the State, it has continued to initiate and support nursing services where the chapters have the funds and desire to offer to the communities such services. As in the past, as soon as a community is ready to take the service over the Red Cross withdraws as an active agency.

In report of the Red Cross supervising nurse for 1919-20 it was stated that the plans for the coming year were "to continue the work, interest the chapters in promoting health work in Virginia, to form nursing committees, to assist them in raising funds for nurses' expenses and to keep alive their interest in the public health nurse." These plans have been consistently followed; and from the statement given below may be seen the number of services that have been established in the State, those withdrawn and those that have been taken over by other agencies. It is felt that the Red Cross chapters have contributed a real service to the communities in demonstrating to them the need for work of this nature; and public health work in Virginia has been advanced many years by this disinterested public service performed by the Red Cross. The demonstration is felt to be successful when the community decides to support the work from public funds.

On September 30, 1920, there were twenty-four Red Cross nurses on duty in Virginia. During the year there have been sixteen resignations and five nursing services have been taken over by county units. Fifteen nurses have been placed in the State by the Red Cross supervising nurse. At the close of the year, September 30, 1921, there are in existence twenty-two services supported more than fifty per cent by Red Cross funds.

Number counties ready for nurses	6
Number Red Cross nurses on duty September 30, 1921	22
Number visits to counties to assist in organizing	20
Number talks before clubs and chapters on work of public health nursing	11
Number conventions, conferences and meetings attended	53
Number of supervisory visits paid to nurses	23

Miss Webb resigned to take effect March 15, 1921.

Consolidation of Potomac Division with Southern Division.

Personnel: Miss Virginia M. Gibbs, assistant director, P. H. N., Southern Division, A. R. C. was with this bureau from May 20, 1921, to July 15th. Miss Bettie McDanald had charge from July 15 to September 15, 1921, when Miss Emily B. Heard assumed responsibility as assistant director of public health nursing in the State.

DENTAL CLINICS.

The persevering efforts of the State Board of Health to arouse the general interest in the importance of mouth hygiene are now being rewarded. The people are awaking to the fact that a large proportion of cases of illness among grown people, of eye and ear trouble, diseased tonsils, malnutrition resulting in stunted growth, slow mentality and retardation among school children, have had their origin in neglected teeth. Retardation results in paying for instruction of the same children in the same grade year after year, and thus wastes many thousands of dollars for the State every session—enough to pay for a sufficient number of dental clinics to reach every child in the State.

The distressing condition of children's mouths (averaging from three to five decayed teeth for each child) as disclosed in this year's physical inspection by nurses and teachers, does not yet show evidence of this awakened interest; but it is confidently expected that next year's report will disclose an appreciable improvement. This improvement will come from the combined efforts of teachers and nurses to induce parents to have treated the defective teeth disclosed by the inspection, but especially to "carrying the war into the enemy's country," as it were, by holding in many of the counties dental clinics where teeth may be put in order at a nominal cost or no cost. These clinics are held by the mouth hygiene director of the State Board of Health, with the assistance of other dentists employed by him.

Dr. E. J. Applewhite, who filled the position of director of mouth hygiene for four months last fall, consumed almost his entire time in visiting the various counties for the purpose of making a survey of the State, and very little clinical work was undertaken in the State until April 1st. Owing to the fact that reports made prior to that time do not show the work in detail, it is impossible to give an accurate report of the work done during the past year. The following is, however, as nearly correct a report as is possible to be made from the data at hand:

COUNTY	Number Children Examined	Fillings, Etc.	Number Children Treated	Fees Collected	Amt. Paid to County by State
Arlington..........	429	2,485	350	$ 513 00	$ 500 00
Fauquier...........	2,189	1,667	418	442 74	500 00
Halifax............	472	343	81	163 45	160 30
Hanover...........	77	....	68	180 00	152 97
Henrico............	203	....	203	....	161 00
Isle of Wight.......	1,234	1,700	....	360 60	517 71
Loudoun...........	559	....	380	....	412 50
Mecklenburg.......	194	554	194	221 75	118 20
Prince George......	342	64	39	67 15	85 00
Rockbridge........	582	1,292	....	424 50	376 28
Westmoreland......	(Nurse died) qu	arterly report m	issing	70 90	120 04
Wise...............	476	1,711	....	570 00	294 24
Total.......	6,959	10,584	1,935	$3,212 45	$3,545 08

The director has had a dental exhibit at several county fairs. The one in Wythe county was especially successful. Ninety-five children had mouth examinations in the presence of their parents, and much interest was aroused. A whole week's exhibit is planned for the State Fair in October. More requests for exhibits have been made than can be filled.

Statistics show that there are seventeen counties in the State which have no dentist; seventeen counties with only one dentist each and sixteen counties with two dentists each, making a total of forty-nine dentists to take care of the work in one-half of the counties in the State.

During the fiscal year there were twenty-three counties that applied for State aid for the support of dental clinics. Of this number fifteen received aid, the fund being insufficient to assist all the counties applying.

There is reason to believe that the majority of the counties having clinics this year will wish to continue the work next year. On account of the small appropriation made to each county, it is impossible to make all needed corrections. In addition to those counties which have received aid, and those which applied but did not receive it, we shall probably have fifteen or twenty additional requests for york next year. In his travels through the various counties, the director has met with many evidences of appreciation of the interest the State is taking in this important work; and he urges that provision be made for taking care of forty counties during the next year. This will necessitate an appropriation of $20,000 for clinical work. With this fund in hand, together with the amount raised by the counties, it would be possible to employ ten clinicians by the year.

Leading dentists of the State agree in the opinion that the services of a sufficient number of desirable men cannot be secured unless they are offered yearly contracts at adequate salaries. The life of a clinician is a hard one; he is moving about constantly among strangers, cut off from his friends and members of his profession; and unless offered adequate salaries desirable men cannot be drawn into this class of work.

It is suggested that a change be made in the method of distribution of the State funds; and a plan be formulated by which each county shall receive aid in proportion to the number of pupils enrolled in the schools and the number of dentists within reach of the schools of each county.

James City county, with a school population of 765, has two dentists, located in the center of the county. Halifax, with an enrollment of 11,050, has only five dentists in the center of the county, with a large number of pupils anywhere from fifteen to thirty-five miles from the nearest dentist. Therefore, if James City county should be granted $500 and should match this with $500 raised in the county, with this amount and the fees collected, it would be possible to take care of practically every school child, even through the high schools in the county; whereas, Halifax county would be able to take care of only about twelve per cent with the same appropriation.

During the past year a number of the counties have received the funds for their dental clinics through local Red Cross chapters, which have thereby practically exhausted the funds in their treasury. It is therefore improbable that they will be able to raise the same amount another year. Several of these counties have expended the full amount raised by them and the amount appropriated by the State, but through judicious management of these clinics they have in hand from $200 to $400 derived from fees collected. If the counties be allowed to use the funds collected from the children for dental services to match the appropriation granted by the State the following year, several counties not otherwise financially able could continue their work next year. Adverse conditions existing in most of the counties, will compel the county authorities to curtail the expenses next year, and it is improbable that those counties which have voted appropriations, either through the board of supervisors or the school boards will be able to continue this aid.

The $20,000 appropriation suggested for the work next year would take care of forty counties if the old plan of distribution is followed, or if the new plan suggested above should be adopted. This work has gotten a good start in the schools and is growing in popularity.

NOSE AND THROAT CLINICS.

As a preliminary to report on the nose and throat clinics I shall refer to the report of the physical inspection made in accordance with the provisions of the West law.

There were such incomplete returns for tonsils and adenoids as to make the figures of no value. In explanation of this, it must be said that for this first year no report was asked. Still many nurses felt that they should report evident cases, and from nineteen counties 3,602 of these cases were reported, the conditions being so bad that even a casual examination could not fail to detect them. Although the examinations were necessarily far from complete and the reports consequently only partial, still enough has been shown to demonstrate beyond the shadow of a doubt the necessity for concentrated action looking toward remedial work.

There are probably a dozen counties in Virginia having nose and throat specialists, and children residing in and around the cities where these specialists are located, are encouraged to have corrections made in an individual way, but many, even in these sections, are unable to pay a regular fee, and for these and the children in remote districts, the clinic plan experimented with this summer proved quite satisfactory. I am unable through lack of complete data to report all clinics held this summer, but can give the following report of seventeen:

Augusta	1 clinic,	8 days,	280 operations,	put on in hospital by P. H. Nurse.
Bedford	1 clinic,	— days,	8 operations,	put on by Community Worker.
Botetourt	1 clinic,	2 days,	54 operations,	(2 colored) by P. H. Nurse.
Giles	1 clinic,	2 days,	48 operations,	(1 colored) by P. H. Nurse.
Fauquier	1 clinic,	2 days,	94 operations,	(33 colored) by P. H. Nurse and Col. Nurse.
Greensville	2 clinics,	3 days,	92 operations,	by P. H. Nurse.
Henry	1 clinic,	1 day,	21 operations,	by P. H. Nurse.
Mecklenburg	2 clinics,	2 days,	37 operations,	by P. H. Nurse
Prince Edward	1 clinic,	2 days,	40 operations,	by P. H. Nurse.
Pulaski	1 clinic,			by Teachers.
Warren	1 clinic,	2 days,	34 operations,	by Red Cross Worker.
Wythe	4 clinics,	5 days,	65 operations,	by P. H. Nurse.
Total	17 clinics,	29 days,	773 operations.	

Reputable specialists from the nearest cities were engaged by the day and as a rule each provided his own anesthetist and surgical nurse. Local doctors assisted with the anesthesia. Each child had a preliminary examination for heart and lung lesions and was barred from the clinic if adverse symptoms were found.

FINANCES.

Some counties have had the benefit of the State Board of Health appropriation which matches funds raised by the county up to $500. Others have depended on the guarantee of individuals to make up a deficit, and still others have gone ahead on the chance of clearing expenses.

A fee of $15 per child has made it possible to take care of a number of children free of charge; this allows for a very limited number, however.

The findings of the teachers this year will make imperative a further development of the correctional nose and throat clinic. So far the clinics have been highly successful, creating a good deal of interest, arousing a demand on the part of the people for future clinics, and a new interest on the part of the teachers in physical inspection.

Finances Needed.

An additional field staff will be necessary, for requests are already coming in for help in checking up the teachers, and arousing community interest in the follow-up work.

Approximately fifty counties or half the State, have no nurses or any organization concentrating on correctional work. If these fifty counties are not to be left behind provision must be made whereby material and professional assistance may be rendered. A fund of $5,000 would allow $100 each for fifty counties raising a like sum, giving a fund of $200 for the initial expenses of the clinic.

Proceeding along the line already being followed in the clinics, securing specialists and assistants at a flat rate per day, an all-time surgical staff consisting of a specialist, surgical nurse and anesthetist could be provided by the State Board of Health at the counties' expense, thereby almost clearing the salaries and travelling expenses of the unit during the months of cold weather. This unit could also be used for educational work in the schools.

BUREAU PLANS FOR THE COMING YEAR.

1. *Educational Hygiene.*

A. Establish the course in school hygiene in every educational institution in Virginia that is registered for teacher training by the State Board of Education.

B. Compile a syllabus for the course in school hygiene which shall be acceptable to the Board of Education and the standards set by the schools and colleges.

C. Establish further correspondence course in health subjects for use by the general public.

D. Organize in every school a health league through which children may learn right health habits.

2. *Public Health Nursing.*

A. Establish an adequate nursing service in each of the one hundred counties in the State.

B. Regulate midwifery and organize courses in midwifery for the six thousand midwives in the State.

C. Make a more determined effort to establish home-nursing classes in every high school in the State.

D. Make a special study of conditions contributing to the large number of still births and infant mortality.

3. *Physical Inspection and Correctional Clinics.*

A. Co-operate with the Board of Education in securing physical inspection for every enrolled child in the public schools.

B. Establish permanent correctional clinics or arrange for clinical facilities in every county in the State.

C. Set on foot a program that will eventually secure a medical examination for every pre-school child in the State with a view towards establishing his physical fitness before he enters school.

D. Make a study of the normal child in co-operation with a program that is being promulgated by the children's bureau of the United States Public Health Service.

4. *Financial Requirements.*

A. For development and extension of the nursing service	$20,000
B. For development and extension of correctional clinics	25,000

INDEX

Page
Letter of transmittal 3
Commissioner's letter to board 5
Morbidity statistics 17

County health work:

Co-operation with U. S. P. H. S. 18
Plans of operation 21
Detailed reports 22
Value of sanitary improvements 23
Report of assistant health commissioner 24
International Health Board 26
Social hygiene 29
Hotels and convict camps—inspection 32

Details of county work:

Albemarle 34
Tazewell 36
Henry 46
Wise 48
Fauquier 52
Halifax 58
Malaria control 51
Social hygiene 61
Inspection of camps and hotels—details 68
Sanitary engineering 75
Municipal water supplies 79
Industrial plant supplies 82
Supplies for institutions and schools 83
Investigations and improvements 84
Laboratory report 116
Work by years 118
Work by months for fiscal year 119
Diagnostic tests 119
Table of rabies positives 120

Tuberculosis sanatoria:

Catawba 121
Blue Ridge 132
Piedmont 142
Tuberculosis education 164
Vital statistics 167
Tables 177 to 195
Child welfare bureau 197
Correspondence course in physical inspection and school hygiene 200
State supervising nurse 207

UNIVERSITY OF MICHIGAN
3 9015 06847 2680